MAIL TO:

STATE OF UTAH
DIVISION OF PURCHASING
3150 STATE OFFICE BUILDING, STATE CAPITOL
P.O. BOX 141061
SALT LAKE CITY, UTAH 84114-1061
TELEPHONE (801) 538-3026
http://www.purchasing.state.ut.us

Request for Proposal

Solicitation Number: **JG3050**

Due Date: **10/22/02 @ 3:00pm**

Date Sent: September 26, 2002

Agency Contract

Goods and services to be purchased: **RFP for ATMS FIBER OPTIC REPAIR**

Please complete

Company Name		Federal Tax Identification Number	
Ordering Address	City	State	Zip Code
Remittance Address (if different from ordering address)	City	State	Zip Code
Type ☐ Corporation ☐ Partnership ☐ Proprietorship ☐ Government	Company Contact Person		
Telephone Number (include area code)	Fax Number (include area code)		
Company's Internet Web Address	Email Address		
Discount Terms (for bid purposes, bid discounts less than 30 days will not be considered)	Days Required for Delivery After Receipt of Order (see attached for any required minimums)		

The following documents are included in this solicitation: Solicitation forms, instructions and general provisions, and specifications. Please review all documents carefully before completing.

The undersigned certifies that the goods or services offered are produced, mined, grown, manufactured, or performed in Utah. Yes_____ No_____. If no, enter where produced, etc._____

Offeror's Authorized Representative's Signature	Date
Type or Print Name	Position or Title

STATE OF UTAH
DIVISION OF PURCHASING

Request for Proposal

Solicitation Number: JG3050

Due Date: 10/22/02 @ 3:00pm

Vendor Name:

THE STATE OF UTAH, DEPARTMENT OF TRANSPORTATION IS SOLICITING THIS REQUEST FOR PROPOSAL (RFP) TO CONTRACT FOR FIBER OPTIC REPAIR WORK ON THE STATES ATMS SYSTEM.

THE AWARD OF THIS SOLICITATION WILL RESULT IN A CONTRACT WITH A DURATION OF TWO (2) YEARS WITH ONE (1) ONE YEAR RENEWAL OPTION.

ALL TECHNICAL AND COST PROPOSALS ARE TO BE SUBMITTED AT THE SAME TIME. FIVECOPIES OF THE PROPOSAL ARE REQUIRED.

A 100% PERFORMANCE BOND WILL BE REQUIRED OF THE AWARDED CONTRACTOR FOR JOBS UNDER THE CONTRACT THAT EXCEED $20,000. PLEASE COMPLETE THE ATTACHED PERFORMANCE BOND FORM AND RETURN IT WITH YOUR PROPOSAL.

YOU MUST BE A LICENSED CONTRACTOR IN THE STATE OF UTAH TO BID THIS PROJECT. PLEASE COMPLETE A CONSTRUCTIONS TRADE LICENSING REQUIREMENTS FORM AND SUBMIT ALONG WITH YOUR PROPOSAL.

NO PRE-PROPOSAL CONFERENCE HAS BEEN SCHEDULED AT THIS TIME.

A COPY OF THE FULL PROPOSAL MAY BE DOWNLOADED AT THE DIVISION OF PURCHASING'S WEBSITE AT WWW.PURCHASING.UTAH.GOV. LOOK FOR 'CURRENT BIDS' THEN SCROLL TO BID NUMBER JG3050. YOU CAN DOWNLOAD AND PRINT A COPY FROM THE PDF FILE. IF PREFERRED, A PAPER COPY OF THE SAME REQUIREMENTS MAY BE OBTAINED AT NO CHARGE VIA US MAIL BY CONTACTING (801) 538-3026. REFERENCE SOLICITATION JG3050 DUE 10/22/02.
****

REFERENCE RX: 810 36000000005

FOR TECHNICAL QUESTIONS CONTACT PAUL KIKUCHI AT pkikuchi@utah.gov OR AT (801) 965-4071.

FOR QUESTIONS PERTAINING TO THE SOLICITATION PROCESS CONTACT JARED GARDNER AT jaredgardner@utah.gov OR (801) 538-3342.

REQUEST FOR PROPOSAL - INSTRUCTIONS AND GENERAL PROVISIONS

1. **PROPOSAL PREPARATION:** (a) All prices and notations must be in ink or typewritten. (b) Price each item separately. Unit price shall be shown and a total price shall be entered for each item bid. (c) Unit price will govern, if there is an error in the extension. (d) Delivery of services as proposed is critical and must be adhered to. (e) Incomplete proposals may be rejected. (f) This proposal may not be withdrawn for a period of 60 days from the due date. (g) Where applicable, all proposals must include complete manufacturer's descriptive literature. (h) By signing the proposal the offeror certifies that all of the information provided is accurate, that they are willing and able to furnish the item(s) specified, and that prices offered are correct.

2. **SUBMITTING THE PROPOSAL:** (a) The proposal must be signed in ink, sealed, and if mailed, mailed in a properly-addressed envelope to the DIVISION OF PURCHASING, 3150 State Office Building, Capitol Hill, Salt Lake City, UT 84114-1061. **The "Solicitation Number" and "Due Date" must appear on the outside of the envelope.** (b) Proposals, modifications, or corrections received after the closing time on the "Due Date" will be considered late and handled in accordance with the Utah Procurement Rules, section 3-209. (c) **Your proposal will be considered only if it is submitted on the forms provided by the state. Facsimile transmission of proposals to DIVISION will not be considered.** (d) All prices quoted must be both F.O.B. Origin per paragraph 1.(c) and F.O.B. Destination. Additional charges including but not limited to delivery, drayage, express, parcel post, packing, cartage, insurance, license fees, permits, costs of bonds, or for any other purpose must be included in the proposal for consideration and approval by the Division of Purchasing & General Services (DIVISION). Upon award of the contract, the shipping terms will be F.O.B. Destination, Freight Prepaid with freight charges to be added to the invoice unless otherwise specified by the DIVISION. No charge for delivery, drayage, express, parcel post, packing, cartage, insurance, license fees, permits, costs of bonds, or for any other purpose will be paid by the state unless specifically included in the proposal and accepted by DIVISION. (e) By signing the proposal the offeror certifies that all of the information provided is accurate and that he/she offers to furnish materials/services for purchase in strict accordance with he requirements of this proposal including all terms and conditions.

3. **BONDS:** The state has the right to require a bid or proposal bond, payment bond and/or a faithful performance bond from the offeror in an amount not to exceed the amount of the contract.

4. **PROPRIETARY INFORMATION:** Suppliers are required to mark any specific information contained in their bid which is not to be disclosed to the public or used for purposes other than the evaluation of the bid. Each request for non-disclosure must be accompanied by a specific justification explaining why the information is to be protected. Pricing and service elements of any proposal will not be considered proprietary. All material becomes the property of the state and may be returned only at the state's option. Proposals submitted may be reviewed and evaluated by any persons at the discretion of the state.

5. **BEST AND FINAL OFFERS:** Discussions may be conducted with offerors who submit proposals determined to be reasonably susceptible of being selected for award for the purpose of assuring full understanding of, and responsiveness to, solicitation requirements. Prior to award, these offerors may be asked to submit best and final offers. In conducting discussions, there shall be no disclosure of any information derived from proposals submitted by a competing offeror.

6. **SAMPLES:** Samples, brochures, etc., when required, must be furnished free of expense to the state and if not destroyed by tests may, upon request made at the time the sample is furnished, be returned at the offeror's expense.

7. **DIVISION APPROVAL:** Contracts written with the State of Utah, as a result of this proposal, will not be legally binding without the written approval of the Director of the DIVISION.

8. **AWARD OF CONTRACT:** (a) The contract will be awarded with reasonable promptness, by written notice, to the lowest responsible offeror whose proposal is determined to be the most advantageous to the state, taking into consideration price and evaluation factors set forth in the RFP. No other factors or criteria will be used in the evaluation. The contract file shall contain the basis on which the award is made. Refer to Utah Code Annotated 65-56-21. (b) The DIVISION can reject any and all proposals. And it can waive any informality, or technicality in any proposal received, if the DIVISION believes it would serve the best interests of the state. (c) Before, or after, the award of a contract the DIVISION has the right to inspect the offeror's premises and all business records to determine the offeror's ability to meet contract requirements. (d) The DIVISION will open proposals publicly, identifying only the names of the offerors. Proposals and modifications shall be time stamped upon receipt and held in a secure place until the due date. After the due date, a **register** of proposals shall be established. The **register** shall be open to public inspection, but the proposals will be seen only by authorized DIVISION staff and those selected by DIVISION to evaluate the proposals. The proposal(s) of the successful offeror(s) shall be open for public inspection for 90 days after the award of the contract(s). (e) Utah has a reciprocal preference law which will be applied against bidders bidding products or services produced in states which discriminate against Utah products. For details see Section 63-56 20.5 -20.6, Utah Code Annotated.

9. **ANTI-DISCRIMINATION ACT:** The offeror agrees to abide by the provisions of the Utah Anti-discrimination Act, Title 34 Chapter 35, U.C.A. 1953, as amended, and Title VI and Title VII of the Civil Rights Act of 1964 (42 USC 2000e), which prohibit discrimination against any employee or applicant for employment, or any applicant or recipient of services, on the basis of race, religion, color, or national origin; and further agrees to abide by Executive Order No. 11246, as amended, which prohibits discrimination on the basis of sex; 45 CFR 90 which prohibits discrimination on the basis of age, and Section 504 of the Rehabilitation Act of 1973 or the Americans with Disabilities Act of 1990, which prohibits discrimination on the basis of disabilities. Also offeror agrees to abide by Utah's Executive Order, dated March 17, 1993, which prohibits sexual harassment in the workplace. Vendor must include this provision in every subcontract or purchase order relating to purchases by the State of Utah to insure that the subcontractors and vendors are bound by this provision.

10. **WARRANTY:** The contractor agrees to warrant and assume responsibility for all products (including hardware, firmware, and/or software products) that it licenses, contracts, or sells to the State of Utah under this contract for a period of one year, unless otherwise specified and mutually agreed upon elsewhere in this contract. The contractor (seller) acknowledges that all warranties granted to the buyer by the Uniform Commercial Code of the State of Utah applies to this contract. Product liability disclaimers and/or warranty disclaimers from the seller are not applicable to this contract unless otherwise specified and mutually agreed upon elsewhere in this contract. In general, the contractor warrants that: (1) the product will do what the salesperson said it would do, (2) the product will live up to all specific claims that the manufacturer makes in their advertisements, (3) the product will be suitable for the ordinary purposes for which such product is used, (4) the product will be suitable for any special purposes that the State has relied on the contractor's skill or judgement to consider when it advised the State about the product, (5) the product has been properly designed and manufactured, and (6) the product is free of significant defects or unusual problems about which the State has not been warned. Remedies available to the State include the following: The contractor will repair or replace (at no charge to the State) the product whose nonconformance is discovered and made known to the contractor in writing. If the repaired and/or replaced product proves to be inadequate, or fails of its essential purpose, the contractor will refund the full amount of any payments that have been made. Nothing in this warranty will be construed to limit any rights or remedies the State of Utah may otherwise have under this contract.

11. **DEBARMENT:** The CONTRACTOR certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction (contract) by any governmental department or agency. If the CONTRACTOR cannot certify this statement, attach a written explanation for review by the STATE.

12. **GOVERNING LAWS AND REGULATIONS:** All State purchases are subject to the Utah Procurement Code, Title 63, Chapter 56 Utah Code Annotated 1953, as amended, and the Procurement Rules as adopted by the Utah State Procurement Policy Board (Utah Administrative Code Section R33). These are available on the Internet at www.purchasing.state.ut.us.

STATE OF UTAH
DIVISION OF PURCHASING

BOND STATEMENT

BIDDING REQUIREMENTS

A 5% bid bond or cashier's check is required by all vendors bidding on this project. The bid bond must be attached to bid or it will be disqualified. Checks submitted will be returned certified mail after an official award has been made.

AWARD REQUIREMENTS

A 100% performance/payment bond will be required from the award vendor within 14 days after notification of award. Bonds must be in the form of a cashiers checks (no personal or business checks) or a surety bond from a licensed surety company doing business in the State of Utah.

Performance/payment bonds (or checks) will be **held as security for a period of 12 months after completion of project, per state law.** Checks submitted will be returned certified mail only after this specified time. Bidders name must be the same on both the bid forms and all bonds submitted.

Please indicate which method of bonding will be used if awarded this job:

_____ 100% CASHIERS CHECK

_____ 100% PERFORMANCE/PAYMENT BOND

Bond/Ins. Company_____

Agent Name_____

Fax #_____ Phone #_____

Upon awarding, the requesting agency will fax a verification to the bonding company listed above to start the bonding process. It is then the responsibility of the vendor or follow through with their bonding agent to assure the bond is processed. After the bonding company sends the bond to vendor for signatures, it is the responsibility of the vendor to mail or hand carry the original bond (no copies or faxes accepted) to the requesting agency, to the attention of the contract person listed on the bid. **No work can commence until the requesting agency has receipt of this performance/payment bond**. After this time the contract will be officially released to the award vendor.

CONSTRUCTION TRADES LICENSING REQUIREMENTS

The State of Utah requires any person engaging in a construction trade or acting as, or representing oneself as a contractor in a construction trade for which licensure is required be licensed **before engaging in that trade or contracting activity. It is unlawful for any unlicensed person to submit a bid for any work for which a license is required.** Any person who violates this provision **can not be awarded or accept a contract** for the performance of the work *(1993 Utah Code Unannotated 58-55-2(32)(a), 58-55-2(32)(h), 58-55-4(1)(a), 58-55-13(1)).*

Definitions

"Construction Trade" means any trade or occupation involving construction, alteration, remodeling, repairing, wrecking or demolition, addition to, or improvement of any building, highway, road, railroad, dam, bridge, structure, excavation or other project, development, or improvement to other than personal property (1993 UCU 58-55-2(5)).

"Contractor" means any person, firm, partnership, corporation, association, or other organization ... [that] undertakes any work in the construction, plumbing, or electrical trade for which licensure is required... (1993 UCU 58-55-2(6)).

Licensed Classifications (See Reverse. List the appropriate contractor license number, classification title, primary or secondary classification number, aggregate dollar limit and license expiration date OR attach a copy of the license. If you plan to utilize subcontractors, they must also be licensed and the same information provided or copy(ies) of license(s) attached:

Prime Contractor

License Number	Expiration Date	Class Title	Class Number	Dollar Limit

Sub-Contractor(s)

License Number	Expiration Date	Class Title	Class Number	Dollar Limit
Name:				
Name:				
Name:				

CONTRACTOR LICENSE CLASSIFICATIONS

Primary Classification Number	Subclassification Number	Title
E100		General Engineering Contractor
B100		General Building Contractor
R100		Residential and Small Commercial Contractor
	R101	Residential and Small Commercial - Nonstructural Remodeling and Repair Contractor
R200		Factory Built Housing Set-up Contractor
S200		General Electrical Contractor
	S201	Residential Electrical Contractor
S210		General Plumbing Contractor
	S211*	Boiler Installation Contractor
	S212	Irrigation Sprinkling Contractor
	S213	Industrial Piping Contractor
	S214*	Water Conditioning Equipment Contractor
S215		Solar Energy Systems Contractor
S216		Residential Sewer Connection & Septic Tank Contractor
S220		Carpentry Contractor
	S221*	Cabinet and Millwork Installation Contractor
S230		Metal and Vinyl Siding Contractor
	S231*	Raingutter Installation Contractor
S240		Glass and Glazing Contractor
S250		Insulation Contractor
S260		General Concrete Contractor
	S261*	Concrete Form Setting and Shoring Contractor
	S262*	Gunite and Pressure Grouting Contractor
S270		General Drywall, Stucco and Plastering Contractor
	S271*	Plastering Stucco Contractor
	S272*	Ceiling Grid Systems, Ceiling Tile and Light-weight Metal and Non-bearing Wall Partitions Contractor
S280		General Roofing Contractor
	S281*	Single Ply and Specialty Coating Contractor
	S282*	Build-up Roofing Contractor
	S283	Shingle and Shake Roofing Contractor
	S284*	Tile Roofing Contractor
	S285*	Metal Roofing Contractor
S290		General Masonry Contractor
	S291*	Stone Masonry Contractor
	S292*	Terrazzo Contractor
	S293	Marble, Tile and Ceramic Contractor
S300		General Painting Contractor
S310		Excavation and Grading Contractor
S320		Steel Erection Contractor
	S321	Steel Reinforcing Contractor
	S322*	Metal Building Erection Contractor
	S323*	Structural Stud Erection Contractor
S330		Landscaping Contractor
S340		Sheet Metal Contractor
S350		HVAC Contractor
	S351	Refrigerated Air Conditioning Contractor
	S352*	Evaporative Cooling Contractor
	S353	Warm Air Heating Contractor
S360		Refrigeration Contractor
S370		Fire Suppression Systems Contractor
S380		Swimming Pool and Spa Contractor
S390		Sewer and Water Pipeline Contractor
S400*		Asphalt Paving Contractor
S410		Pipeline and Conduit Contractor
S420*		General Fencing and Guardrail Contractor
	S421*	Residential Fencing Contractor
S430*		Metal Firebox and Fuel Burning Stove Installation
S440		Sign Installation Contractor
	S441*	Non-Electrical Outdoor Advertising Sign Contractor
S450		Mechanical Insulation Contractor
S460*		Wrecking and Demolition Contractor
S470*		Petroleum System Contractor
S480*		Piers and Foundations Contractor

***No Trade Examination is required. All applicants must take and pass the Utah Business and Law examination if not previously taken and passed.**

ATTACHMENT A: STANDARD TERMS AND CONDITIONS

1. **AUTHORITY:** Provisions of this contract are pursuant to the authority set forth in 63-56, Utah Code Annotated, 1953, as amended, Utah State Procurement Rules (Utah Administrative Code Section R33), and related statutes which permit the STATE to purchase certain specified services, and other approved purchases for the STATE.

2. **CONTRACT JURISDICTION, CHOICE OF LAW, AND VENUE:** The provisions of this contract shall be governed by the laws of the State of Utah. The parties will submit to the jurisdiction of the courts of the State of Utah for any dispute arising out of this Contract or the breach thereof. Venue shall be in Salt Lake City, in the Third Judicial District Court for Salt Lake County.

3. **LAWS AND REGULATIONS:** Any and all supplies, services and equipment furnished will comply fully with all applicable Federal and State laws and regulations.

4. **RECORDS ADMINISTRATION:** The CONTRACTOR shall maintain, or supervise the maintenance of all records necessary to properly account for the payments made to the CONTRACTOR for costs authorized by this contract. These records shall be retained by the CONTRACTOR for at least four years after the contract terminates, or until all audits initiated within the four years, have been completed, whichever is later. The CONTRACTOR agrees to allow STATE and Federal auditors, and STATE Agency Staff, access to all the records to this contract, for audit and inspection, and monitoring of services. Such access will be during normal business hours, or by appointment.

5. **CONFLICT OF INTEREST:** CONTRACTOR represents that none of its officers or employees are officers or employees of the State of Utah, unless disclosure has been made in accordance with 67-16-8, Utah Code Annotated, 1953, as amended.

6. **CONTRACTOR, AN INDEPENDENT CONTRACTOR:** The CONTRACTOR shall be an independent contractor, and as such, shall have no authorization, express or implied, to bind the STATE to any agreements, settlements, liability, or understanding whatsoever, and agrees not to perform any acts as agent for the STATE, except as herein expressly set forth. Compensation stated herein shall be the total amount payable to the CONTRACTOR by the STATE. The CONTRACTOR shall be responsible for the payment of all income tax and social security amounts due as a result of payments received from the STATE for these contract services. Persons employed by the STATE and acting under the direction of the STATE shall not be deemed to be employees or agents of the CONTRACTOR.

7. **INDEMNITY CLAUSE:** The CONTRACTOR agrees to indemnify, save harmless, and release the STATE OF UTAH, and all its officers, agents, volunteers, and employees from and against any and all loss, damages, injury, liability, suits, and proceedings arising out of the performance of this contract which are caused in whole or in part by the negligence of the CONTRACTOR'S officers, agents, volunteers, or employees, but not for claims arising from the State's sole negligence.

8. **EQUAL OPPORTUNITY CLAUSE:** The CONTRACTOR agrees to abide by the provisions of Title VI and VII of the Civil Rights Act of 1964 (42USC 2000e) which prohibits discrimination against any employee or applicant for employment or any applicant or recipient of services, on the basis of race, religion, color, or national origin; and further agrees to abide by Executive Order No. 11246, as amended, which prohibits discrimination on the basis of sex; 45 CFR 90 which prohibits discrimination on the basis of age; and Section 504 of the Rehabilitation Act of 1973, or the Americans with Disabilities Act of 1990 which prohibits discrimination on the basis of disabilities. Also, the CONTRACTOR agrees to abide by Utah's Executive Order, dated March 17, 1993, which prohibits sexual harassment in the work place.

9. **SEPARABILITY CLAUSE:** A declaration by any court, or any other binding legal source, that any provision of this contract is illegal and void shall not affect the legality and enforceability of any other provision of this contract, unless the provisions are mutually dependent.

10. **RENEGOTIATION OR MODIFICATIONS:** This contract may be amended, modified, or supplemented only by written amendment to the contract, executed by the parties hereto, and attached to the original signed copy of the contract.

11. **DEBARMENT:** The CONTRACTOR certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction (contract), by any governmental department or agency. If the CONTRACTOR cannot certify this statement, attach a written explanation for review by the STATE.

12. **TERMINATION:** Unless otherwise stated in the Special Terms and Conditions, this contract may be terminated, with cause by either party, in advance of the specified termination date, upon written notice being given by the other party. The party in violation will be given ten (10) working days after notification to correct and cease the violations, after which the contract may be terminated for cause. This contract may be terminated without cause, in advance of the specified expiration date, by either party, upon 90 days prior written notice being given the other party. On termination of this contract, all accounts and payments will be processed according to the financial arrangements set forth herein for approved services rendered to date of termination.

13. **SALES TAX EXEMPTION:** The State of Utah's sales and use tax exemption number is E33399. The tangible personal property or services being purchased are being paid from State funds and used in the exercise of that entity's essential functions. If the items being purchased are construction materials, they will be converted into real property by employees of this government entity, unless otherwise stated in the contract.

14. **WARRANTY:** The contractor agrees to warrant and assume responsibility for all products (including hardware, firmware, and/or software products) that it licenses, contracts, or sells to the State of Utah under this contract for a period of one year, unless otherwise specified and mutually agreed upon elsewhere in this contract. The contractor (seller) acknowledges that all warranties granted to the buyer by the Uniform Commercial Code of the State of Utah apply to this contract. Product liability disclaimers and/or warranty disclaimers from the seller are not applicable to this contract unless otherwise specified and mutually agreed upon elsewhere in this contract. In general, the contractor warrants that: (1) the product will do what the salesperson said it would do, (2) the product will live up to all specific claims that the manufacturer makes in their advertisements, (3) the product will be suitable for the ordinary purposes for which such product is used, (4) the product will be suitable for any special purposes that the State has relied on the contractor's skill or judgement to consider when it advised the State about the product, (5) the product has been properly designed and manufactured, and (6) the product is free of significant defects or unusual problems about which the State has not been warned. Remedies available to the State include the following: The contractor will repair or replace (at no charge to the State) the product whose nonconformance is discovered and made known to the contractor in writing. If the repaired and/or replaced product proves to be inadequate, or fails of its essential purpose, the contractor will refund the full amount of any payments that have been made. Nothing in this warranty will be construed to limit any rights or remedies the State of Utah may otherwise have under this contract.

15. **PUBLIC INFORMATION:** Contractor agrees that the contract will be a public document, as to distribution of copies, and Contractor gives the STATE express permission to make copies of the contract and/or of the response to the solicitation in accordance with the State of Utah Government Records Access and Management Act. The permission to make copies as noted will take precedence over any statements of confidentiality, proprietary information, copyright information, or similar notation.

MAINTENANCE OF ATMS FIBER OPTIC SYSTEM
Project Number CM-9999(301)
Request for Proposal

1.0 Introduction

Utah Department of Transportation (UDOT) desires to establish a contract(s) for the repair, maintenance and installation of our Advanced Traffic Management System (ATMS) fiber optic communication infrastructure within the State of Utah. The contract(s) will be for two-years with a one-year option.

The State will consider awarding this as a multiple contract for Region 1, 2, or 3, multiple Regions, or awarded to a single contractor. The bid price shall include the cost of the material and installation if installed in Region 1, 2, or 3. Region 1 will include Weber County and Northern portion of Davis County. Region 2 will include Salt Lake County, southern portion of Davis, Tooele and Summit County. Region 3 will include Utah County. For those items supplied by the state, installation cost shall be required. The Contractor may submit a bid for one, two or all three Regions.

State Purchasing Agent:
Jared Gardner
P.O. Box 141061
3150 State Office Building, Capitol Hill
Salt Lake City, Utah 84114-1061
Phone (801) 538-3342
Fax Number (801) 538-3882

UDOT Purchasing Agent
Paul Kikuchi
4501 South 2700 West
Salt Lake City, Utah 84119
Phone: (801) 965-4071
Fax Number: (801) 965-4073

Note all questions or inquires pertaining to this Proposal shall be directed to the above UDOT Purchasing Agent.

Expected Contract Type: Time and Materials Contract

Est. Contract Award Date: November 2002

2.0 Back Ground

UDOT has been aggressively installing fiber optic cable and equipment for use in our ATMS. Approximately 570 miles of cable have been installed, of which 80% is underground and 20% aerial.

2.1 The following information in sections 2.2 and 2.3 are provided to the Contractor for orientation only. While it is likely work orders under this contract are most likely to occur in areas with the most fiber-optic infrastructure, there is no guarantee.

2.2 Most of the existing ATMS fiber (backbone, distribution) and devices (drop cable) are located in the following counties:

COUNTY	MILES OF FIBER (miles)	NUMBER OF DEVICES (DROP CABLE) CONNECTED TO FIBER (each)
Salt Lake	376	880
Summit	9	17
Utah	19[#]	43
Weber	150	98
Davis	15	17

Table1. Approximate quantities of ATMS fiber and devices per County (Year 2001).

Each of the above mentioned devices are connected to the distribution fiber via a fiber optic drop cable. The cumulative lengths of the drop cable are not reflected in the miles of fiber.

2.3 The following tables lists the number of recorded fiber optic breaks per region:

Region (Counties)	Conduit Only (ea)	Conduit and Distribution or Backbone Fiber (ea)	Conduit and Drop Cable Fiber: (ea)	Aerial Fiber (ea)
Region 1* (Weber N. Davis)	2	0	1	0
Region 2** (Salt Lake, Summit, S. Davis)	6	13	6	0
Region 3*** (Utah)	1	2	0	2
Region 4****	0	0	0	0

Table 2. Approximate Reported Fiber Hits per Region
*Region 1: Records from 1998 through 2001
**Region 2: May 2000 through October 2001
***Region 3: Records from 1999 through 2001
****Region 4: no fiber hits recorded

3.0 Specific Tasks

3.1 The Contractor shall supply labor, materials, tools, and equipment to maintain, repair and expand the ATMS fiber optic communication infrastructure.

3.2 The prime contractor shall perform 80 % of the work. Due to emergency situations and response times, the contractor must be at the UDOT Traffic Operations Center, located at 2010 South 2760 West, Salt Lake City, UT. **with-in two hours of the call.**

3.3 Work will be ordered by UDOT on an as-needed on-call basis and may include, but not be limited to:

3.3.1 Repairs to ATMS fiber optic cables damaged by dig-ups. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, and Exhibit 4, 13594 Fiber Optic Communication for repair procedure in appendix.

3.3.2 Relocation or replacement of ATMS fiber optic cable associated with road reconstruction work. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, Exhibit 4, 13594 Fiber Optic Communication and Standard Drawing AT-6 and AT-7 for installation procedure in appendix.

3.3.3 Installation of new ATMS fiber optic cables to provide communication from existing ATMS fiber trunk lines to new traffic signals, cameras, etc. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2,13554 Polymer Concrete Junction Box, Exhibit 3, 13555 ATMS Cabinet, Exhibit 4, 13594 Fiber Optic Communication, and Standard Drawing AT-6 and AT-7 for installation procedure in appendix.

3.3.4 Associated repair, replacement or installation of conduit, and junction boxes. See Exhibit 13553 1, ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, Exhibit 4, 13594 Fiber Optic Communication and Standard Drawing AT-6 and AT-7 for repair and installation procedure in appendix.

3.3.5 Troubleshooting of the ATMS fiber-optic communication system, including field, Hub and TOC equipment. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, and Exhibit 4, 13594 Fiber Optic Communication for procedures in appendix.

3.3.6 Inspection and oversight of third party ATMS fiber installation. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, and Exhibit 4, 13594 Fiber Optic Communication for procedures in appendix.

3.3.7 Integration and testing services. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, and Exhibit 4, 13594 Fiber Optic Communication for procedure in appendix.

3.4 In areas of high traffic volume, the Contractor will be restricted from working in travel lanes in the direction of rush hour traffic during peak commute times. The UDOT Region Traffic Engineer will determine the restricted hours on an

individual basis.

See section 4.12 for information concerning traffic control devices to be used.

3.5 The unit price for items listed in the summary of items will include the installation cost. Quantities included in summary of items are for estimating purposes only. Payment will be based on actual quantities placed. Any increase or decrease in quantities will not be grounds for adjusting the unit bid prices. There is no guarantee to purchase any quantities.

3.6 Prior to any changes or new additions to the fiber optic system, a written approval must be obtained by the State.

4.0 General Requirements

4.1. Technical Specifications- A State Representative shall request work from the Contractor under the following three conditions:

4.1.1 The Contractor shall provide an on call Technical/Inspector. The Technical/Inspector shall, within 2 hours of being notified visit the damaged fiber optics site. The on call Technical/Inspector shall inspect the site and provide a cost estimate for the repair work and the length of time to complete the work. Upon approval of the cost of the work and length of time to complete the work, a work order shall be issued (section 4.4).

4.1.2 Scheduled Work - The Contractor shall begin work within 72 hours of notification by UDOT unless otherwise agreed upon. No premium time will be paid on scheduled activities for work the Contractor performs after normal business hours.

4.1.3 Emergency callout - It is expected all repair work will be performed during normal work hours which will be considered Monday - Friday, 7:00 AM to 4:00 PM. However, UDOT may occasionally call the Contractor for emergency inspections of damage or work estimates after normal working hours. In those cases, UDOT will pay for labor at the unit bid price for Labor Emergency Rate (Technical/Inspector). When called out on an emergency, the Contractor shall be on site and begin work within two hours of notification by UDOT . All other hours including weekends and the following holidays will pay for labor at the unit bid price for Labor Emergency Rate (Technical/Inspector): Memorial Day, July 4th, Labor Day, Thanksgiving, Christmas and New Years.

4.2 UDOT Safety Regulations - Contractor shall continually meet all UDOT work zone and safety requirements including wearing of protective clothing (hard hats, retro reflective orange, and safety toed shoes. Properly maintained equipment and certified and trained operators are required.

4.3 Material - The Contractor shall maintain an inventory of all material, including spare parts and incidental equipment needed to perform the type of work specified herein. The Contractor shall have the appropriate storage facility to house all material. The storage facility must be approved by a State representative at the Contractors facility. The following material and quantities will be stocked at the site:

4.3.1 Polymer Concrete Junction Boxes (10 each - Type II and Type III)

4.3.2 Fiber Optic Cable (3000 feet - Single Mode Fiber Optic Cable in the following Strand Counts: 18,and 36). The use of this fiber optic cable will be determined by UDOT if lead time for ordered fiber optic cable is excessive.

4.3.3 Splice Enclosure (2 each - Type A and Type B)

4.3.4 Heavy Duty Spider Fanout Kit (5 each for the following strand counts: 6, 12, 18, and 24)

4.3.5 The Contractor will be required to maintain the inventory in quantities stated in section 5.3 at Contractor=s purchased cost from the supplier.

4.4 Method of Ordering Work - The Project Manager or Project Inspector shall provide a written work order number. The work order may be provided verbally then followed by a faxed or e-mailed version. Requests for Emergency Response for damage assessment repair estimates, or inspection will generally be issued verbally. Work to be performed under regular rates will generally be ordered in writing, in which case, the Contractor will be requested to prepare a written cost estimate and time to complete work prior to beginning work. The Region traffic engineer will be notified of work that will occur within the road travel way.

4.5 Approval of Estimates - Approval of estimate will occur when a State Representative or his designee signs, and returns the estimate and time to

complete the repair to the Contractor. If the State does not agree with the estimate, the State will negotiate the scope of work with the Contractor. If an agreement can not be made, the State may go outside the contract to complete work.

4.6 Estimates shall be a good faith estimate for labor and materials required to complete a work order in a timely manner. Estimates will be used to ensure an understanding between UDOT and the Contractor. Estimates will not be strictly binding to the Contractor if unanticipated construction conditions impact the work.

4.7 Contractor invoices may be submitted monthly or may be submitted at the completion of individual work orders.

4.7.1 Invoices - No invoice will be processed until all pertinent and current documentation is supplied. Invoices shall indicate:

A. Work order number (referenced to written estimate and authorization.)
B. Location and date of the work.
C. Person, time and date of verbal authorization (if applicable).
D. Tabulation of quantities and contract unit prices.
E. Copy of OTDR tests (if applicable) in both e-mail form and hard copy, Light Test Sheets (Exhibit 4, section 13594 Fiber Optic Communication in appendix), and all modifications to existing system redlined on department furnished As-Built drawings, including splice detail sheets.
F. All required documentation as specified within pay item descriptions.

4.8 The Contractor shall notify the Project Manager of any work being done for other clients in the area of UDOT's fiber optic cable. This must be done prior to any work being started. The Project Manager requires this information in the event the Contractor performing work for another party in the area accidentally damages UDOT's fiber optic cable.

4.9 Unless specifically stated otherwise, Contractor shall salvage all existing fiber in lengths greater than 200 feet and return to the Project Manager or Project Inspector at UDOT Station 225 address 1950 South 500 West. The Contractor will provide to the Department in a written form, the amount of fiber installed or removed, strand counts, reel ID to within +/- 25 feet and inventory of salvaged cable.

4.10 **Work Order Acceptance**

4.10.1 The Project Manager or Project Inspector will conduct an inspection upon receiving notice from the Contractor of work order completion. If the work order is found to be satisfactorily completed, the inspection shall constitute the final inspection and the Project Manager or Project Inspector will notify the Contractor in writing the date the Contract was inspected and accepted.

4.10.2 After an inspection of the work, the Project Manager or Project Inspector finds any unsatisfactory work. The Contractor shall complete corrective action within 2 regular working days to comply with and rectify the unsatisfactory work.

4.10.3 Upon correction of the work, another inspection will be conducted that constitutes the final inspection.

4.10.4 When the work has been satisfactorily completed, the Project Manager or Project Inspector will notify the Contractor in writing of the date of final inspection and acceptance.

4.11 Mobilization

Mobilization for projects, are to be figured into the overall price.

4.12 Traffic Control

4.12.1 Traffic Control outside of the shoulder shall be the responsibility of the Contractor. Traffic Control Plan will have to be approved by a State representative 48 hours prior to the beginning of work.

4.12.2 Traffic control within the travel way will be provided by UDOT. Restrictions on work is given in section 4.12.2 Contacting a Project Manager or Project Inspector with a specific request for traffic control. The Designate will need to be contacted 48 hours prior to the need for traffic control.

4.12.3 In areas of high traffic volume, the Contractor will be restricted from working in travel lanes in the direction of rush hour traffic during peak commute times. The UDOT Traffic Engineer will determine the restricted hours on an individual basis.

5.0. Contractor Information: Provide answers to the following:

5.1 General Background Information from the Contractor

5.1.2 Explain how your company will start responsive repair work within 72 hours after notification to proceed on the work order?

5.1.3 UDOT will supply materials specified in the contract. Explain how your company will track and replace UDOT materials used?

5.1.4 What action would your company take to assure supplies or product are available to cover needs in an emergency call?

5.1.5 Provide an address where would you stock the products outlined in the General Requirements 4.3

5.1.6 What measures would you take to ensure your inventory and staff are sufficient for emergency service provided on a week-end or during a holiday?

5.1.7 Define what experience your company has had in furnishing a Communications Shelter as defined in this RFP. List up to 3 locations.

5.1.8 Expand on your experience in the installation or modification of foundations and junction boxes of different sizes.

5.1.9 When splicing or connecting cable what methods do you use to keep the work environment clean and free of contaminates?

5.1.10 When labeling the cable, what process and type of labeling equipment do you use?

5.2 References:

5.2.1 Furnish 3 references from previous customers who we can contact from previous overhead and underground fiber optic projects that would provide information on your company's ability to be a full service fiber optic Contractor for UDOT. This would highlight your company's capacity to provide the supplies, equipment, manpower and financial ratings to successfully complete all requirements in this contract.

5.2.2 Provide (3) reference names, dates, contacts and detailed explanations of previous jobs which would best relate to UDOT's specification in the installation and implementation of the (3) types of conduit listed in **Exhibit 1, 13553 Page 2, Part 2 ATMS Conduit**. Include trenching, preparation, installation, backfill and restoration information.

5.2.3 Provide a name and contact number for your closest supplier to Salt Lake City who can provide fiber optic materials in the event that you are out of stock?

5.3 **Financial and Record Keeping**:

5.3.1 Explain in detail your method to keep orderly, accurate, records and accounting documentation for each job site.

5.3.2 What procedures will you implement to assure all submittals, required testing and acceptance correspondence are executed as defined in section 13594 Fiber Optic Communication@, include retrieving of documents of completed jobs.

5.3.3 Share with us the system your company would implement to accurately file OTDR calibration certificates and the dispersing of such information to UDOT.

5.3.4 After reviewing the entire proposed Maintenance of ATMS Fiber Optics material, explain what systematic approach would be in place to assure all reporting requirements specified would be performed.

5.3.5 Detail a procedure you would implement for documentation of authorizations and approval of work completed.

5.4 **Policy and Procedures**

5.4.1 Explain how you will meet UDOT's work zone and safety clothing requirements including properly maintained equipment with trained and certified operators.

5.4.2 What procedures will your company have in place to provide an itemized invoice which will list State stockpiled materials used?

5.4.3 Explain your inventory policy and procedure to monitor and order more supplies keeping the minimum stocking levels on hand?

5.4.4 What method would be implemented to assure the procurement of materials, installation of the fiber optic cables, boxes, equipment, splicing, accessories and procedures used will meet the standards set forth in this contract.

5.5 **Personnel**

5.5.1. Provide a list of your personnel who will be working on this contract who are Fiber Optic Certified for outside plant and fusion splice by companies such as Corning or Seicor. Provide information about relevant education, number of years experience and number of years certified for those individuals who will be working on UDOT Projects relating to this proposed contract.

5.5.2 Provide copies of all your current flagger's certificates of individuals who will be working on the resulting contract.

5.5.3 In your 2-hour response time list how many in your staff will be available to work on this contract who are skilled qualified estimator(s)? Each will be responsible for a detailed estimate of time, materials, and equipment needs to arrive at a quality quote. Please furnish the length of time your estimator has held that position with your company or other companies.

5.5.4 Indicate the number of available employees who will be working on this UDOT contract who will have experience in a Communications Shelter installing equipment, accessories, pulling fiber optic cable, and accessories.

5.5.5 Make a note of any requirements in **Exhibit 1, 13553, Exhibit 2, 13554, Exhibit 3, 13555 and Exhibit 4, 13594** in which your certified personnel in Fiber Optics have not, or can not perform.

5.56 Contractor must provide at the time of bid submital a list of owned equipment necessary for the project to the engineer or project inspector including fiber splicers, OTDRs, power meters, cable pulling equipment and heavy machinery such as boring machines and backhoes. Contractor must provide certification of calibration to the engineer or project inspector for all equipment used for splicing and testing

6.0 Proposal Preparation and Submission Instructions

6.1 **Organization of Proposal.**

In order to be deemed responsive to this RFP, the Contractor must divide their proposal into the following sections. Offerors will be required to submit separate Technical and Price proposals. Technical proposals must be submitted in a three-ring binder. One original copy and five (5) copies of the Technical proposal are required.

6.1.1 Letter of Transmittal

The letter shall include name(s), title(s), office address(es), e-mail address, telephone(s) and fax number(s) of the person(s) responsible for the proposal. The letter of transmittal shall be signed by a representative authorized to bind the Bidder, and shall contain a statement to the effect that the proposal is a firm offer.

6.1.2 Provide Pricing

The bid price shall include the cost of the material and installation costs if installed in Region 1, 2, or 3. Region 1 will include Weber county and Northern portion of Davis county. Region 2 will include Salt Lake county, southern portion of Davis county, Tooele county, and Summit county. Region 3 will include Utah county. For those items supplied by the state, installation cost shall be required. The Contractor may submit a bid for one, two or all three Regions. The lowest bidder that meets UDOT=s requirements will receive the highest score for this portion of the scoring. Contractor must fill out the following information in attachement:
ATMS Region 1 Summery of Items
ATMS Region 2 Summery of Items
ATMS Region 3 Summery of Items

6.1.3 Questions and Answers

Provide a detailed written response all questions in Section 5.0
Attach supporting documents (when required) to the back of your response on each page.

6.2 Inquiries

If additional information is needed regarding contractual or bidding requirements outlined in this Request for Proposal please contact:

Paul Kikuchi, Purchasing Agent
Utah Department of Transportation
4501 South 2700 West
Salt Lake City, Utah 84119
Telephone (801) 965-4071
Fax (801) 965-4073
E-mail pkikuchi@utah.gov

Inquiries regarding this proposal shall be directed, in writing via fax, or e-mail

7.0 Proposal Evaluation

Detailed Evaluation - A detailed scoring evaluation will be conducted for those proposals which have passed the initial evaluation. The scoring evaluation will be accomplished in a consistent and uniform manner for all proposals. A source selection committee shall be established. Members of the committee will score each proposal according to pre-established evaluation criteria and weights for relative importance. Scores from each committee member will be combined into a composite score for each offer.
Labor and Material costs will be evaluated to determine realism, completeness, and reasonableness to ensure all aspects of costs have been considered. All bids may receive a score. If oral presentations are deemed necessary only the top four bidders or less that meet our criteria will be considered to present.

7.1 Pricing 50%

The Contractor's price is to be listed on the ATMS Region 1, 2 and 3, Summary of Items Section and reference ATMS Measurement of Payment. The Contractor does not have to bid on all three Regions. Each Region's bid will be considered separately. A breakdown of what must be included in each bid price is given in the Measurement of Payment Section. The Offeror with the lowest initial price shall receive the highest score for this section of this proposal evaluation.

7.2 Background 35%

The contractor with past performance which closely relates to this contract and has the best customer satisfaction and fulfills UDOT's requirements shall receive the highest score for this section of the proposal evaluation.

7.3 Financial and Record Keeping 5%
The Contractor who provides UDOT with their most efficient record keeping methods shall receive the highest proposal evaluation for this section.

7.4 Equipment 10%
A list of company owned heavy operational equipment available that will meet the needs of this contract.

7.5 Criteria Scoring. For all criteria, scoring will range from zero (non responsive) to 10 (excellent). Raw scores will be multiplied by the relative weight to determine a score on each criteria.

7.6 Oral Presentation - A Contractor whose proposal is determined acceptable or potentially acceptable of being selected for contract award, may be required to make oral presentations to the source selection committee. Presentations will be for the purpose of clarifying requirements, technical / work approach, and other aspects of the proposal. Proposals may be accepted without oral presentations. Scoring will be finalized after oral presentations using the above criteria.

8. Contract Award:

This contract will be awarded and completed by the State of Utah Division of Purchasing. The contract will incorporate the bidder=s response and the original RFP.

REFERENCES

3.1 Manual on Uniform Traffic Control Devices, Latest Edition (MUTCD).
A copy of the Traffic Control portion of the MUTCD may be purchased from Utah Department of Transportation's Division of Traffic and Safety at: (801)-965-4259

3.2 Instruction to Flaggers Handbook, Latest Edition.
A copy of the Instruction to Flaggers Handbook may be purchased from Utah Department of Transportation's Division of Traffic and Safety at: (801)-965-4259

3.3 UDOT Standard Specifications, Latest Edition.
UDOT's Standard Specifications may be found on Utah Department of Transportation's website under project development.

MAINTENANCE OF ATMS FIBER OPTIC SYSTEM
Project Number CM-9999(301)
Request for Proposal

1.0 Introduction

Utah Department of Transportation (UDOT) desires to establish a contract(s) for the repair, maintenance and installation of our Advanced Traffic Management System (ATMS) fiber optic communication infrastructure within the State of Utah. The contract(s) will be for two-years with a one-year option.

The State will consider awarding this as a multiple contract for Region 1, 2, or 3, multiple Regions, or awarded to a single contractor. The bid price shall include the cost of the material and installation if installed in Region 1, 2, or 3. Region 1 will include Weber County and Northern portion of Davis County. Region 2 will include Salt Lake County, southern portion of Davis, Tooele and Summit County. Region 3 will include Utah County. For those items supplied by the state, installation cost shall be required. The Contractor may submit a bid for one, two or all three Regions.

State Purchasing Agent:
Jared Gardner
P.O. Box 141061
3150 State Office Building, Capitol Hill
Salt Lake City, Utah 84114-1061
Phone (801) 538-3342
Fax Number (801) 538-3882

UDOT Purchasing Agent
Paul Kikuchi
4501 South 2700 West
Salt Lake City, Utah 84119
Phone: (801) 965-4071
Fax Number: (801) 965-4073

Note all questions or inquires pertaining to this Proposal shall be directed to the above UDOT Purchasing Agent.

Expected Contract Type: Time and Materials Contract

Est. Contract Award Date: November 2002

2.0 Back Ground

UDOT has been aggressively installing fiber optic cable and equipment for use in our ATMS. Approximately 570 miles of cable have been installed, of which 80% is underground and 20% aerial.

2.1 The following information in sections 2.2 and 2.3 are provided to the Contractor for orientation only. While it is likely work orders under this contract are most likely to occur in areas with the most fiber-optic infrastructure, there is no guarantee.

2.2 Most of the existing ATMS fiber (backbone, distribution) and devices (drop cable) are located in the following counties:

COUNTY	MILES OF FIBER (miles)	NUMBER OF DEVICES (DROP CABLE) CONNECTED TO FIBER (each)
Salt Lake	376	880
Summit	9	17
Utah	19[#]	43
Weber	150	98
Davis	15	17

Table1. Approximate quantities of ATMS fiber and devices per County (Year 2001).

Each of the above mentioned devices are connected to the distribution fiber via a fiber optic drop cable. The cumulative lengths of the drop cable are not reflected in the miles of fiber.

2.3 The following tables lists the number of recorded fiber optic breaks per region:

Region (Counties)	Conduit Only (ea)	Conduit and Distribution or Backbone Fiber (ea)	Conduit and Drop Cable Fiber: (ea)	Aerial Fiber (ea)
Region 1* (Weber N. Davis)	2	0	1	0
Region 2** (Salt Lake, Summit, S. Davis)	6	13	6	0
Region 3*** (Utah)	1	2	0	2
Region 4****	0	0	0	0

Table 2. Approximate Reported Fiber Hits per Region
*Region 1: Records from 1998 through 2001
**Region 2: May 2000 through October 2001
***Region 3: Records from 1999 through 2001
****Region 4: no fiber hits recorded

3.0 Specific Tasks

3.1 The Contractor shall supply labor, materials, tools, and equipment to maintain, repair and expand the ATMS fiber optic communication infrastructure.

3.2 The prime contractor shall perform 80 % of the work. Due to emergency situations and response times, the contractor must be at the UDOT Traffic Operations Center, located at 2010 South 2760 West, Salt Lake City, UT. **with-in two hours of the call.**

3.3 Work will be ordered by UDOT on an as-needed on-call basis and may include, but not be limited to:

3.3.1 Repairs to ATMS fiber optic cables damaged by dig-ups. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, and Exhibit 4, 13594 Fiber Optic Communication for repair procedure in appendix.

3.3.2 Relocation or replacement of ATMS fiber optic cable associated with road reconstruction work. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, Exhibit 4, 13594 Fiber Optic Communication and Standard Drawing AT-6 and AT-7 for installation procedure in appendix.

3.3.3 Installation of new ATMS fiber optic cables to provide communication from existing ATMS fiber trunk lines to new traffic signals, cameras, etc. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2,13554 Polymer Concrete Junction Box, Exhibit 3, 13555 ATMS Cabinet, Exhibit 4, 13594 Fiber Optic Communication, and Standard Drawing AT-6 and AT-7 for installation procedure in appendix.

3.3.4 Associated repair, replacement or installation of conduit, and junction boxes. See Exhibit 13553 1, ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, Exhibit 4, 13594 Fiber Optic Communication and Standard Drawing AT-6 and AT-7 for repair and installation procedure in appendix.

3.3.5 Troubleshooting of the ATMS fiber-optic communication system, including field, Hub and TOC equipment. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, and Exhibit 4, 13594 Fiber Optic Communication for procedures in appendix.

3.3.6 Inspection and oversight of third party ATMS fiber installation. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, and Exhibit 4, 13594 Fiber Optic Communication for procedures in appendix.

3.3.7 Integration and testing services. See Exhibit 1, 13553 ATMS Conduit, Exhibit 2, 13554 Polymer Concrete Junction Box, and Exhibit 4, 13594 Fiber Optic Communication for procedure in appendix.

3.4 In areas of high traffic volume, the Contractor will be restricted from working in travel lanes in the direction of rush hour traffic during peak commute times. The UDOT Region Traffic Engineer will determine the restricted hours on an

individual basis.

See section 4.12 for information concerning traffic control devices to be used.

3.5 The unit price for items listed in the summary of items will include the installation cost. Quantities included in summary of items are for estimating purposes only. Payment will be based on actual quantities placed. Any increase or decrease in quantities will not be grounds for adjusting the unit bid prices. There is no guarantee to purchase any quantities.

3.6 Prior to any changes or new additions to the fiber optic system, a written approval must be obtained by the State.

4.0 General Requirements

4.1. Technical Specifications- A State Representative shall request work from the Contractor under the following three conditions:

4.1.1 The Contractor shall provide an on call Technical/Inspector. The Technical/Inspector shall, within 2 hours of being notified visit the damaged fiber optics site. The on call Technical/Inspector shall inspect the site and provide a cost estimate for the repair work and the length of time to complete the work. Upon approval of the cost of the work and length of time to complete the work, a work order shall be issued (section 4.4).

4.1.2 Scheduled Work - The Contractor shall begin work within 72 hours of notification by UDOT unless otherwise agreed upon. No premium time will be paid on scheduled activities for work the Contractor performs after normal business hours.

4.1.3 Emergency callout - It is expected all repair work will be performed during normal work hours which will be considered Monday - Friday, 7:00 AM to 4:00 PM. However, UDOT may occasionally call the Contractor for emergency inspections of damage or work estimates after normal working hours. In those cases, UDOT will pay for labor at the unit bid price for Labor Emergency Rate (Technical/Inspector). When called out on an emergency, the Contractor shall be on site and begin work within two hours of notification by UDOT . All other hours including weekends and the following holidays will pay for labor at the unit bid price for Labor Emergency Rate (Technical/Inspector): Memorial Day, July 4th, Labor Day, Thanksgiving, Christmas and New Years.

4.2 UDOT Safety Regulations - Contractor shall continually meet all UDOT work zone and safety requirements including wearing of protective clothing (hard hats, retro reflective orange, and safety toed shoes. Properly maintained equipment and certified and trained operators are required.

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E. Copy of OTDR tests (if applicable) in both e-mail form and hard copy, Light Test Sheets (Exhibit 4, section 13594 Fiber Optic Communication in appendix), and all modifications to existing system redlined on department furnished As-Built drawings, including splice detail sheets.
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5.3.3 Share with us the system your company would implement to accurately file OTDR calibration certificates and the dispersing of such information to UDOT.

5.3.4 After reviewing the entire proposed Maintenance of ATMS Fiber Optics material, explain what systematic approach would be in place to assure all reporting requirements specified would be performed.

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5.4 **Policy and Procedures**

5.4.1 Explain how you will meet UDOT's work zone and safety clothing requirements including properly maintained equipment with trained and certified operators.

5.4.2 What procedures will your company have in place to provide an itemized invoice which will list State stockpiled materials used?

5.4.3 Explain your inventory policy and procedure to monitor and order more supplies keeping the minimum stocking levels on hand?

5.4.4 What method would be implemented to assure the procurement of materials, installation of the fiber optic cables, boxes, equipment, splicing, accessories and procedures used will meet the standards set forth in this contract.

5.5 **Personnel**

5.5.1. Provide a list of your personnel who will be working on this contract who are Fiber Optic Certified for outside plant and fusion splice by companies such as Corning or Seicor. Provide information about relevant education, number of years experience and number of years certified for those individuals who will be working on UDOT Projects relating to this proposed contract.

5.5.2 Provide copies of all your current flagger's certificates of individuals who will be working on the resulting contract.

5.5.3 In your 2-hour response time list how many in your staff will be available to work on this contract who are skilled qualified estimator(s)? Each will be responsible for a detailed estimate of time, materials, and equipment needs to arrive at a quality quote. Please furnish the length of time your estimator has held that position with your company or other companies.

5.5.4 Indicate the number of available employees who will be working on this UDOT contract who will have experience in a Communications Shelter installing equipment, accessories, pulling fiber optic cable, and accessories.

5.5.5 Make a note of any requirements in **Exhibit 1, 13553, Exhibit 2, 13554, Exhibit 3, 13555 and Exhibit 4, 13594** in which your certified personnel in Fiber Optics have not, or can not perform.

5.56 Contractor must provide at the time of bid submital a list of owned equipment necessary for the project to the engineer or project inspector including fiber splicers, OTDRs, power meters, cable pulling equipment and heavy machinery such as boring machines and backhoes. Contractor must provide certification of calibration to the engineer or project inspector for all equipment used for splicing and testing

6.0 Proposal Preparation and Submission Instructions

6.1 **Organization of Proposal.**

In order to be deemed responsive to this RFP, the Contractor must divide their proposal into the following sections. Offerors will be required to submit separate Technical and Price proposals. Technical proposals must be submitted in a three-ring binder. One original copy and five (5) copies of the Technical proposal are required.

6.1.1 Letter of Transmittal

The letter shall include name(s), title(s), office address(es), e-mail address, telephone(s) and fax number(s) of the person(s) responsible for the proposal. The letter of transmittal shall be signed by a representative authorized to bind the Bidder, and shall contain a statement to the effect that the proposal is a firm offer.

6.1.2 Provide Pricing

The bid price shall include the cost of the material and installation costs if installed in Region 1, 2, or 3. Region 1 will include Weber county and Northern portion of Davis county. Region 2 will include Salt Lake county, southern portion of Davis county, Tooele county, and Summit county. Region 3 will include Utah county. For those items supplied by the state, installation cost shall be required. The Contractor may submit a bid for one, two or all three Regions. The lowest bidder that meets UDOT=s requirements will receive the highest score for this portion of the scoring. Contractor must fill out the following information in attachement:
ATMS Region 1 Summery of Items
ATMS Region 2 Summery of Items
ATMS Region 3 Summery of Items

6.1.3 Questions and Answers

Provide a detailed written response all questions in Section 5.0
Attach supporting documents (when required) to the back of your response on each page.

6.2 Inquiries

If additional information is needed regarding contractual or bidding requirements outlined in this Request for Proposal please contact:

Paul Kikuchi, Purchasing Agent
Utah Department of Transportation
4501 South 2700 West
Salt Lake City, Utah 84119
Telephone (801) 965-4071
Fax (801) 965-4073
E-mail pkikuchi@utah.gov

Inquiries regarding this proposal shall be directed, in writing via fax, or e-mail

7.0 Proposal Evaluation

Detailed Evaluation - A detailed scoring evaluation will be conducted for those proposals which have passed the initial evaluation. The scoring evaluation will be accomplished in a consistent and uniform manner for all proposals. A source selection committee shall be established. Members of the committee will score each proposal according to pre-established evaluation criteria and weights for relative importance. Scores from each committee member will be combined into a composite score for each offer.
Labor and Material costs will be evaluated to determine realism, completeness, and reasonableness to ensure all aspects of costs have been considered. All bids may receive a score. If oral presentations are deemed necessary only the top four bidders or less that meet our criteria will be considered to present.

7.1 Pricing 50%

The Contractor's price is to be listed on the ATMS Region 1, 2 and 3, Summary of Items Section and reference ATMS Measurement of Payment. The Contractor does not have to bid on all three Regions. Each Region's bid will be considered separately. A breakdown of what must be included in each bid price is given in the Measurement of Payment Section. The Offeror with the lowest initial price shall receive the highest score for this section of this proposal evaluation.

7.2 Background 35%

The contractor with past performance which closely relates to this contract and has the best customer satisfaction and fulfills UDOT's requirements shall receive the highest score for this section of the proposal evaluation.

7.3 Financial and Record Keeping 5%
The Contractor who provides UDOT with their most efficient record keeping methods shall receive the highest proposal evaluation for this section.

7.4 Equipment 10%
A list of company owned heavy operational equipment available that will meet the needs of this contract.

7.5 Criteria Scoring. For all criteria, scoring will range from zero (non responsive) to 10 (excellent). Raw scores will be multiplied by the relative weight to determine a score on each criteria.

7.6 Oral Presentation - A Contractor whose proposal is determined acceptable or potentially acceptable of being selected for contract award, may be required to make oral presentations to the source selection committee. Presentations will be for the purpose of clarifying requirements, technical / work approach, and other aspects of the proposal. Proposals may be accepted without oral presentations. Scoring will be finalized after oral presentations using the above criteria.

8. Contract Award:

This contract will be awarded and completed by the State of Utah Division of Purchasing. The contract will incorporate the bidder=s response and the original RFP.

REFERENCES

3.1 Manual on Uniform Traffic Control Devices, Latest Edition (MUTCD).
A copy of the Traffic Control portion of the MUTCD may be purchased from Utah Department of Transportation's Division of Traffic and Safety at: (801)-965-4259

3.2 Instruction to Flaggers Handbook, Latest Edition.
A copy of the Instruction to Flaggers Handbook may be purchased from Utah Department of Transportation's Division of Traffic and Safety at: (801)-965-4259

3.3 UDOT Standard Specifications, Latest Edition.
UDOT's Standard Specifications may be found on Utah Department of Transportation's website under project development.

Attachment C
ATMS Fiber Optic Maintenance Proposal
Special Terms and Conditions

1.0 Responsibility For Wages.

The Contractor shall be responsible for all applicable company wages in accordance with the federal, state and local laws and ordinances.

2.0 Employment of State Employees.

The CONTRACTOR agrees not to engage in any way the services on this contract of any present or former STATE employee who was involved as a decision maker in the selection or approval process or who negotiated and/or approved billings or contract modification for this contract.

3.0 Non-Compete Agreements.

The CONTRACTOR represents that its officers and employees are free to contract with the STATE and are not subject to restrictions by the terms of their present or past employment including, but not limited to, an agreement not to compete for a period of time, unless disclosure has been made. CONTRACTOR must disclose to the STATE any possible conflicts, in writing, before the contract is signed, and the STATE will evaluate whether to continue with contract execution. The STATE may elect to terminate a contract immediately with CONTRACTOR who is subsequently determined to be subject to such restrictions, without liability to the STATE. If the STATE elects to terminate the contract fro this reason, the STATE will supersede paragraph # 12 in Attachment A – Standard Terms and Conditions, and will not provide 30 days prior notice to the CONTRACTOR.

4.0 Quality of Services.

Contractor represents to STATE that it is experienced in and thoroughly familiar with all aspects of the services required hereunder and is properly qualified as applicable and is equipped, organized, and financially able to perform the services.

No changes in the services to be provided by CONTRACTOR under this Contract shall be made without STATE's prior written approval.

5.0 Suspension of Work.

Should the STATE desire to suspend the work, but not terminate the contract, this will be done by written confirmation. The work may be reinstated upon two (2) weeks advance written notice from the STATE. The STATE understands any such suspension of the work may affect both the time of performance and price to complete the work when reinstated.

6.0 Assignment and Subcontracting.

The CONTRACTOR shall not sublet, assign or transfer no greater than 20% of any specific project resulting from this contract without prior written approval from STATE.

Neither shall the provision of monies due under this contract be assignable without prior written approval of STATE.

7.0 Failure to Complete.

At any time the CONTRACTOR determines the contract work cannot be completed within the specified time or budget, the CONTRACTOR must notify the STATE in writing, immediately. The STATE may, at its sole discretion, extend the contract by written modification.

8.0 Non Performance.

If, at any time the CONTRACTOR fails to demonstrate the required expertise (as represented in the CONTRACTOR's proposal) or fails to meet acceptable standards of performance, the STATE **reserves the right to require the CONTRACTOR to correct this measure.** This corrective action must be approved by the STATE Project Manager. If the CONTRACTOR fails to accomplish a project objective or meet schedule commitments established in meetings with the STATE Project manager, this contract may be canceled immediately. If the STATE elects to terminate the contract for this reason, the STATE will supersede paragraph # 12 in Attachment A – Standard Terms and Conditions, and will not provide 30 days prior notice to the CONTRACTOR.

9.0 Termination.

The occurrence of any of the following constitutes a breach by CONTRACTOR unless corrected by CONTRACTOR within two (2) weeks.

CONTRACTOR failure to perform services and/or deliver product on time.

Services performed and/or products delivered by CONTRACTOR do not conform with the terms set forth in this Contract.

CONTRACTOR fails to perform any material provision of this Contract.

CONTRACTOR assigns this Contract, or any obligation or rights hereunder. (The term "assign" to include, without limitation, a transfer of majority.)

CONTRACTOR sells or merges with a third-party (not a parent or subsidiary company) without the prior written consent of STATE.

CONTRACTOR becomes insolvent or makes an assignment for the benefit of creditors, or receiver, or similar officer is appointed to take charge of all or part of CONTRACTOR's assets.

CONTRACTOR shall cure any of the above breaches and notify STATE of such cure within two (2) weeks from receipt of a notice to cure from STATE. If CONTRACTOR fails to cure, STATE may terminate this Contract by giving CONTRACTOR written notice. STATE shall have no liability to CONTRACTOR thereafter except for payment of any balance due for conforming services performed prior to the date of STATE's

notice to cure. STATE may, at its option and without regard to CONTRACTOR's ability to cure, terminate this Contract for cause in the event of any second or subsequent instances of the above breaches by CONTRACTOR.

10.0 Termination for Other Than Non-Performance.

If the STATE terminates for reasons other than non-performance, the CONTRACTOR is relieved of any performance responsibilities on the project, and the withheld performance guarantee amount will be released by the STATE. The estimated completion of project may overlap in new fiscal years. (STATE fiscal year is from July 1, to June 30). If funding is not allocated for individual projects that overlap into the new fiscal year, the project will be automatically terminated on June 30th without written notice to contract.

11.0 Forum For Enforcement.

Any controversy of claim arising out of, in connection with, or relating to this Contract or a breach thereof shall be settled by arbitration under the arbitration rule of the American Arbitration Association, Utah Board. The Arbitration proceeding shall be governed by the Statues of the State of Utah, and the proceeding shall be held in Salt Lake City, Utah. Anything to the contrary contained in the above mentioned rules and statues notwithstanding, the parties consent that any papers, notices, or process necessary or proper for the institution or continuance of, or relating to any arbitration proceeding, or for the confirmation of an award and entry of judgment on any award made, including appeals in connection with any judgment or award, may be served on each of the parties by registered mail addressed to the party at the principal office of the party or by personal service on the party in or without the above mentioned state. The parties hereby recognize and consent to the above mentioned arbitration association's jurisdiction over each and every one of them.

12.0 Complete Delivery.

Delivery shall not be deemed to be complete until the goods and services have been actually received and accepted by STATE.

13.0 Licenses and Certification.

The Contractor, the Contractors personnel and the Contractors equipment shall be in compliance with all laws and regulations for Licensing and Certification from all governing agencies.

14.0 Complete Contract.

This contract is intended by the parties as a final expression of their agreement, and supersedes all prior communications, representations and agreement, oral and written, between the parties with respect to the subject matter contained herein. The parties also intend this contract to be a complete and exclusive statement of the terms of their agreement. This contract may not be modified or terminated orally, and no claimed modification, rescission or waiver shall be binding on the STATE unless in writing, signed by a duly authorized representative of the STATE.

15.0 Contractor Not an Agent.

CONTRACTOR, including it agents and employees, is an independent CONTRACTOR and not an agent or employee of the STATE. Contractor is not authorized to represent and State expressly disclaims any liability resulting from such misrepresentation.

16.0 Claim Delays And Extensions.

The Contractor agrees to proceed with the work previously authorized by the contract, or in writing, continually and diligently and will make no charges or claims for extra compensation for delays or hindrances within its control during the progress of this contract, for a reasonable period as agreed by the parties, should a delay or hindrance occur. State shall not waive any of its rights under the contract by permitting the Contractor to proceed with the contract after the established completion date.

Contractor assigns this Contract, or any obligation or rights hereunder. (The term "assign" to include, without limitation a transfer of majority).

Contractor Sells or merges with a third-party (not a parent or subsidiary company) without the prior written consent of State.

Contractor becomes insolvent or make an assignment for the benefit of creditors, or a receiver, or similar officer is appointed to take charge of all or part of Contractor's assets.

Contractor shall cure any of the above breaches and notify State of such cure within five (5) days from receipt of a notice to cure from State. If Contractor fails to cure, State may terminate this Contract by giving Contractor written notice. State shall have not liability to Contractor thereafter except for payment of any balance due for conforming services performed prior to the date of State's notice to cure. State may at its option and without regard to Contractor's ability to cure, terminate this Contract for cause in the event of any second or subsequent instances of the above breaches by Contractor.

17.0 Notification.

Any notice given under this Contract shall be written, or sent by facsimile or by other electronic means. Written notice shall be sent by registered or certified mail, postage prepaid, return receipt requested, or by any other overnight delivery service which delivers to the noticed destination and provides proof of delivery to the sender. Any facsimile or other electronic notice must be followed within three (3) days by written notice. All notices shall be effective when first received at the following addresses:

If to Contractor	If to State
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with copies to:	with copies to:

18.0 Performance Bond

At the time the contract is executed, the Contractor shall provide a performance bond amounting to fifteen percent (15%) of the bid amount guaranteeing performance and payment.

MEASUREMENT AND PAYMENT

Fiber Optic Maintenance

The Department will measure and pay for each bid item as detailed in this section.

Payment is contingent upon acceptance by the Department.

Items are listed by Specification and in tables as follows:

Bid Item Number	Bid Item Name	Unit of Measurement and payment
Additional information		

1		**Traffic Control**	**Lump sum with the following considerations:**
1. Traffic Control outside of the shoulder shall be the responsibility of the contractor. Traffic control plan will have to be approved by Doug Price 801-514-9789, 48 hours prior to be beginning of work. 2. Traffic control within the travel way will be provided by UDOT. Contact Doug Price at 801-514-9789 or 801-887-3767 for traffic control. He will need to be contacted 48 hours prior to the need for traffic control.			

2		**1 inch Conduit Trenched in Native Earth**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
3		**2 inch Conduit Trenched in Native Earth**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
4		**3 inch Conduit Trenched in Native Earth**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		

5		**1D Conduit Trenched in Native Earth**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
6		**2D Conduit Trenched in Native Earth**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
7		**4D Conduit Trenched in Native Earth**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		

8		**1 inch Conduit Bored, Jacked or Drilled**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
9		**2 inch Conduit Bored, Jacked or Drilled**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
10		**3 inch Conduit Bored, Jacked or Drilled**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		

11		**1D Conduit Bored, Jacked or Drilled**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
12		**2D Conduit Bored, Jacked or Drilled**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
13		**4D Conduit Bored, Jacked or Drilled**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		

14		**1 inch Conduit in Pavement, Concrete or Sidewalk**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
15		**2 inch Conduit in Pavement, Concrete or Sidewalk**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
16		**3 inch Conduit in Pavement, Concrete or Sidewalk**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		

17		**1D Conduit in Pavement, Concrete or Sidewalk**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
18		**2D Conduit in Pavement, Concrete or Sidewalk**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		
19		**4D Conduit in Pavement, Concrete or Sidewalk**	**Foot**
	Includes all materials, labor, workmanship, and equipment required to install all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, resurfacing of road, replacement of sidewalk, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, restriping of pavement, boring/drilling equipment, warning tape, locate wire, pull rope, bend sections, couplings, duct seal, bushings, adapters, and all other materials and labor necessary to complete installations. Includes all conduits in trench.		

20		**Spot Repair 1 inch Conduit**	**Each**
	Includes all material, labor, workmanship, and equipment required to locate and repair all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, warning tape, locate wire, pull rope, bend sections, couplings, bushings, adapters, and all other material and labor necessary to complete repair. The length that constitutes a spot repair will be less than 5 feet.		
21		**Spot Repair 2 inch Conduit**	**Each**
	Includes all material, labor, workmanship, and equipment required to locate and repair all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, warning tape, locate wire, pull rope, bend sections, couplings, bushings, adapters, and all other material and labor necessary to complete repair. The length that constitutes a spot repair will be less than 5 feet.		
22		**Spot Repair 3 inch Conduit**	**Each**
	Includes all material, labor, workmanship, and equipment required to locate and repair all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, warning tape, locate wire, pull rope, bend sections, couplings, bushings, adapters, and all other material and labor necessary to complete repair. The length that constitutes a spot repair will be less than 5 feet.		

23		**Spot Repair 1D Conduit**	**Each**
	Includes all material, labor, workmanship, and equipment required to locate and repair all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, warning tape, locate wire, pull rope, bend sections, couplings, bushings, adapters, and all other material and labor necessary to complete repair. The length that constitutes a spot repair will be less than 5 feet.		
24		**Spot Repair 2D Conduit**	**Each**
	Includes all material, labor, workmanship, and equipment required to locate and repair all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, warning tape, locate wire, pull rope, bend sections, couplings, bushings, adapters, and all other material and labor necessary to complete repair. The length that constitutes a spot repair will be less than 5 feet.		
25		**Spot Repair 4D Conduit**	**Each**
	Includes all material, labor, workmanship, and equipment required to locate and repair all conduit. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area prior to final layer, warning tape, locate wire, pull rope, bend sections, couplings, bushings, adapters, and all other material and labor necessary to complete repair. The length that constitutes a spot repair will be less than 5 feet.		
26		**Type I-Polymer Concrete Junction Box**	**Each**
	Includes all materials, labor, workmanship, and equipment required to furnish and install junction boxes as shown on the plans and details. Includes all incidental items, such as concrete collars around junction boxes, grout, lids, backfill, maintenance markers, duct seal, ground rods, termination kits, removal and disposal of existing boxes, excavation, grading, disposal of surplus materials and all other materials, labor and equipment necessary to complete the installation of junction boxes.		
27		**Type II-Polymer Concrete Junction Box**	**Each**
	Includes all materials, labor, workmanship, and equipment required to furnish and install junction boxes as shown on the plans and details. Includes all incidental items, such as concrete collars around junction boxes, grout, lids, backfill, maintenance markers, duct seal, ground rods, termination kits, removal and disposal of existing boxes, excavation, grading, disposal of surplus materials and all other materials, labor and equipment necessary to complete the installation of junction boxes.		
28		**Type III-Polymer Concrete Junction Box**	**Each**
	Includes all materials, labor, workmanship, and equipment required to furnish and install junction boxes as shown on the plans and details. Includes all incidental items, such as concrete collars around junction boxes, grout, lids, backfill, maintenance markers, duct seal, ground rods, termination kits, removal and disposal of existing boxes, excavation, grading, disposal of surplus materials and all other materials, labor and equipment necessary to complete the installation of junction boxes.		

29		**Single Mode Fiber Optic Cable Installation – 6 Strand Count**	**Foot**
	Includes all labor, workmanship, and equipment required to Install aerial Fiber Optic Cable and Fiber Optic Cable in conduit. Includes all labor, workmanship, and equipment required to transport Fiber Optic Reels from State Warehouse to Job site, or Contractors Stock.		
30		**Single Mode Fiber Optic Cable Installation – 12 Strand Count**	**Foot**
	Includes all labor, workmanship, and equipment required to Install aerial Fiber Optic Cable and Fiber Optic Cable in conduit. Includes all labor, workmanship, and equipment required to transport Fiber Optic Reels from State Warehouse to Job site, or Contractors Stock.		
31		**Single Mode Fiber Optic Cable Installation – 18 Strand Count**	**Foot**
	Includes all labor, workmanship, and equipment required to Install aerial Fiber Optic Cable and Fiber Optic Cable in conduit. Includes all labor, workmanship, and equipment required to transport Fiber Optic Reels from State Warehouse to Job site, or Contractors Stock.		
32		**Single Mode Fiber Optic Cable Installation –24 Strand Count**	**Foot**
	Includes all labor, workmanship, and equipment required to Install aerial Fiber Optic Cable and Fiber Optic Cable in conduit. Includes all labor, workmanship, and equipment required to transport Fiber Optic Reels from State Warehouse to Job site, or Contractors Stock.		
33		**Single Mode Fiber Optic Cable Installation – 36 Strand Count**	**Foot**
	Includes all labor, workmanship, and equipment required to Install aerial Fiber Optic Cable and Fiber Optic Cable in conduit. Includes all labor, workmanship, and equipment required to transport Fiber Optic Reels from State Warehouse to Job site, or Contractors Stock.		

34		**Single Mode Fiber Optic Cable Removal**	**Foot**
	Includes all labor, workmanship, and equipment required to Remove aerial Fiber Optic Cable and Fiber Optic Cable in conduit. Includes all labor, workmanship, and equipment required to transport Fiber Optic Reels from State Warehouse to Job site, or Contractors Stock. Unless specifically stated otherwise, the Contractor will salvage all existing fiber in lengths greater than 2000 feet and return to the Department. The contractor will provide to the Department in a written form, the amount of new fiber installed, the strand counts used, reel id to within ± 25 feet and inventory of salvaged cable including length and strand-count.		

35		**Type A Fiber Optic Splice Enclosures and Termination**	**Each**
	Includes all labor, workmanship, and equipment required to splice, terminate, or install the splice enclosure. Includes all incidentals such as re-entry kits for enclosures, pressure testing equipment, ID tags for fiber and enclosure end panels.		
36		**Type B Fiber Optic Splice Enclosures and Termination**	**Each**
	Includes all labor, workmanship, and equipment required to splice, terminate, or install the splice enclosure. Includes all incidentals such as re-entry kits for enclosures, pressure testing equipment, ID tags for fiber and enclosure end panels.		

37		**Heavy Duty Spider Fanout Kit (6 Strand)**	**Each**
	Includes all labor, workmanship, and equipment required to splice, terminate, or install the above Bid Items. Contractor to store 5 each of Department Furnished Bid Items 035 – 041. Maximum insertion loss for connectors will be 0.75 dB. Includes all incidentals such as re-entry kits for enclosures, pressure testing equipment, ID tags for fiber and enclosure end panels.		
38		**Heavy Duty Spider Fanout Kit (12 Strand)**	**Each**
	Includes all labor, workmanship, and equipment required to splice, terminate, or install the above Bid Items. Contractor to store 5 each of Department Furnished Bid Items 035 – 041. Maximum insertion loss for connectors will be 0.75 dB. Includes all incidentals such as re-entry kits for enclosures, pressure testing equipment, ID tags for fiber and enclosure end panels.		
39		**Heavy Duty Spider Fanout Kit (18 Strand)**	**Each**
	Includes all labor, workmanship, and equipment required to splice, terminate, or install the above Bid Items. Contractor to store 5 each of Department Furnished Bid Items 035 – 041. Maximum insertion loss for connectors will be 0.75 dB. Includes all incidentals such as re-entry kits for enclosures, pressure testing equipment, ID tags for fiber and enclosure end panels.		
40		**Heavy Duty Spider Fanout Kit (24 Strand)**	**Each**
	Includes all labor, workmanship, and equipment required to splice, terminate, or install the above Bid Items. Contractor to store 5 each of Department Furnished Bid Items 035 – 041. Maximum insertion loss for connectors will be 0.75 dB. Includes all incidentals such as re-entry kits for enclosures, pressure testing equipment, ID tags for fiber and enclosure end panels.		

41		**1 – 3 Fusion Splices**	**Each**
	Includes all labor, workmanship, and equipment required to Fusion Splice the above quantities.		
42		**4 – 12 Fusion Splices**	**Each**
	Includes all labor, workmanship, and equipment required to Fusion Splice the above quantities.		
43		**13 – 48 Fusion Splices**	**Each**
	Includes all labor, workmanship, and equipment required to Fusion Splice the above quantities.		
44		**49 – 96 Fusion Splices**	**Each**
	Includes all labor, workmanship, and equipment required to Fusion Splice the above quantities		
45		**97+ Fusion Splices**	**Each**
	Includes all labor, workmanship, and equipment required to Fusion Splice the above quantities.		

46		**Fiber Optic Light Source/Power Meter Test**	**Each**
	Includes all labor, workmanship, and equipment required to perform the Fiber Optic Light Source/Power Meter Test.		
47		**OTDR Trace**	**Each**
	Includes all labor, workmanship, and equipment required to perform the OTDR Trace.		
48		**Fiber Optic As-Built Drawings**	**Each**
	As-Built drawings will be provided to the Department showing any change to the existing system. These will be shown as additions to the current As-Builts.		

49		**Labor (Technician/Inspector)**	**Hour**
	All miscellaneous labor not already included in other unit bid price items includes but not limited to inspections, of damage assessments, work estimates etc. includes vehicle, consumables and other items.		
50		**Labor Emergency Rate (Technician/Inspector)**	**Hour**
	All miscellaneous labor not already included in other unit bid price items includes but not limited to inspections, of damage assessments, work estimates etc. includes vehicle, consumables and items.		

51		**Repair Asphalt Concrete Surface**	**Square Foot**
	Includes all material, labor, workmanship, and equipment required to repair all surfaces. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area before final layer. Repair surface area to original condition.		
52		**Repair Portland Cement Concrete Pavement (PCCP)**	**Square Foot**
	Includes all material, labor, workmanship, and equipment required to repair all surfaces. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area before final layer. Repair surface area to original condition.		
53		**Repair Sidewalk**	**Square Foot**
	Includes all material, labor, workmanship, and equipment required to repair all sidewalk surfaces. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area before final layer. Repair surface area to original condition.		
54		**Repair Stamped Decorative Surface**	**Square Foot**
	Includes all material, labor, workmanship, and equipment required to repair all surfaces. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area before final layer. Repair surface area to original condition.		
55		**Repair Curb and Gutter**	**Square Foot**
	Includes all material, labor, workmanship, and equipment required to repair all surfaces. Includes all incidental items, such as trenching, backfill, flowable fill, re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems, protection of area before final layer. Repair surface area to original condition.		
56		**Repair Landscaping**	**Square Foot**
	Includes all material, labor, workmanship, and equipment required to repair all surfaces. Includes all incidental items, such as re-seeding or sod work, all restoration of vegetation, repair or replacement of damaged sprinkler systems.		

Maintenance of ATMS Fiber Optic System
Region 1
Summary of Items

	DESCRIPTION	unit	quantity	unit price	extended price
1	Traffic Control	Lump	3		
2	1 inchs Conduit Trenched in Native Earth	LF	30		
3	2 inchs Conduit Trenched in Native Earth	LF	30		
4	3 inchs Conduit Trenched in Native Earth	LF	30		
5	1D Conduit Trenched in Native Earth	LF	30		
6	2D Conduit Trenched in Native Earth	LF	30		
7	4D Conduit Trenched in Native Earth	LF	30		
8	1 inchs Conduit Bored, Jacked, or Drilled	LF	30		
9	2 inchs Conduit Bored, Jacked, or Drilled	LF	30		
10	3 inchs Conduit Bored, Jacked, or Drilled	LF	30		
11	1D Conduit Bored, Jacked, or Drilled	LF	30		
12	2D Conduit Bored, Jacked, or Drilled	LF	30		
13	4D Conduit Bored, Jacked, or Drilled	LF	30		
14	1 inchs Conduit Trenched in Native Earth	LF	30		
15	2 inchs Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
16	3 inchs Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
17	1D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
18	2D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
19	4D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
20	Spot Repair 1 inchs Conduit	EA	2		
21	Spot Repair 2 inchs Conduit	EA	2		
22	Spot Repair 3 inchs Conduit	EA	2		
23	Spot Repair 1D Conduit	EA	1		
24	Spot Repair 2D Conduit	EA	1		
25	Spot Repair 4D Conduit	EA	1		
26	Type I- Polymer Concrete Junction Box	EA	1		
27	Type II-Polymer Concrete Junction Box	EA	1		
28	Type III-Polymer Concrete Junction Box	EA	1		
29	Single Mode Fiber Optic Cable Installation - 6 Strand Count	LF	450		
30	Single Mode Fiber Optic Cable Installation - 12 Strand Count	LF	450		
31	Single Mode Fiber Optic Cable Installation - 18 Strand Count	LF	450		
32	Single Mode Fiber Optic Cable Installation - 24 Strand Count	LF	450		
33	Single Mode Fiber Optic Cable Installation - 36 Strand Count	LF	450		
34	Single Mode Fiber Optic Cable Removal	LF	450		
35	Type A Fiber Optic Splice Enclosures and Termination	EA	3		
36	Type B Fiber Optic Splice Enclosures and Termination	EA	3		
37	Heavy Duty Spider Fanout Kit (6 Strand)	EA	3		
38	Heavy Duty Spider Fanout Kit (12 Strand)	EA	1		
39	Heavy Duty Spider Fanout Kit (18 Strand)	EA	1		
40	Heavy Duty Spider Fanout Kit (24 Strand)	EA	1		
41	1-3 Fusion Splices	EA	2		
42	4-12 Fusion Splices	EA	2		
43	13-48 Fusion Splices	EA	1		
44	49-96 Fusion Splices	EA	1		
45	97+ Fusion Splices	EA	1		
46	Fiber Optic Light Source/Power Meter Test	EA	23		
47	OTDR Trace	EA	23		
48	Fiber Optic As Built Drawings	EA	2		
49	Labor (technical/Inspector)	Hr	15		
50	Labor Emergency Rate (Technical/Inspector)	Hr	23		
51	Repair Asphalt Concrete Surface	SF	150		
50	Repair Portland Cement Concrete Pavement (PCCP)	SF	150		
53	Repair Sidewalk	SF	150		

Maintenance of ATMS Fiber Optic System
Region 1
Summary of Items

	DESCRIPTION	unit	quantity	unit price	extended price
54	Repair Stamped Decorative Surface	SF	112		
55	Repair Curb and Gutter	SF	112		
56	Repair Landscaping	SF	112		

Maintenance of ATMS Fiber Optic System
Region 2
Summary of Items

	DESCRIPTION	unit	quantity	unit price	extended price
1	Traffic Control	Lump	14		0
2	1 inchs Conduit Trenched in Native Earth	LF	140		0
3	2 inchs Conduit Trenched in Native Earth	LF	140		
4	3 inchs Conduit Trenched in Native Earth	LF	140		0
5	1D Conduit Trenched in Native Earth	LF	140		0
6	2D Conduit Trenched in Native Earth	LF	140		0
7	4D Conduit Trenched in Native Earth	LF	140		0
8	1 inchs Conduit Bored, Jacked, or Drilled	LF	140		
9	2 inchs Conduit Bored, Jacked, or Drilled	LF	140		0
10	3 inchs Conduit Bored, Jacked, or Drilled	LF	140		0
11	1D Conduit Bored, Jacked, or Drilled	LF	140		0
12	2D Conduit Bored, Jacked, or Drilled	LF	140		0
13	4D Conduit Bored, Jacked, or Drilled	LF	140		0
14	1 inchs Conduit Trenched in Native Earth	LF	140		
15	2 inchs Conduit Trenched in Pavement, Concrete, Sidewalk	LF	140		0
16	3 inchs Conduit Trenched in Pavement, Concrete, Sidewalk	LF	140		0
17	1D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	140		0
18	2D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	140		0
19	4D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	140		0
20	Spot Repair 1 inchs Conduit	EA	7		
21	Spot Repair 2 inchs Conduit	EA	7		0
22	Spot Repair 3 inchs Conduit	EA	7		0
23	Spot Repair 1D Conduit	EA	3		0
24	Spot Repair 2D Conduit	EA	3		0
25	Spot Repair 4D Conduit	EA	3		0
26	Type I- Polymer Concrete Junction Box	EA	3		
27	Type II-Polymer Concrete Junction Box	EA	3		
28	Type III-Polymer Concrete Junction Box	EA	3		
29	Single Mode Fiber Optic Cable Installation - 6 Strand Count	LF	2100		
30	Single Mode Fiber Optic Cable Installation - 12 Strand Count	LF	2100		
31	Single Mode Fiber Optic Cable Installation - 18 Strand Count	LF	2100		
32	Single Mode Fiber Optic Cable Installation - 24 Strand Count	LF	2100		
33	Single Mode Fiber Optic Cable Installation - 36 Strand Count	LF	2100		
34	Single Mode Fiber Optic Cable Removal	LF	2100		
35	Type A Fiber Optic Splice Enclosures and Termination	EA	11		
36	Type B Fiber Optic Splice Enclosures and Termination	EA	11		
37	Heavy Duty Spider Fanout Kit (6 Strand)	EA	11		
38	Heavy Duty Spider Fanout Kit (12 Strand)	EA	3		
39	Heavy Duty Spider Fanout Kit (18 Strand)	EA	3		
40	Heavy Duty Spider Fanout Kit (24 Strand)	EA	3		
41	1-3 Fusion Splices	EA	7		
42	4-12 Fusion Splices	EA	11		
43	13-48 Fusion Splices	EA	3		
44	49-96 Fusion Splices	EA	1		
45	97+ Fusion Splices	EA	1		
46	Fiber Optic Light Source/Power Meter Test	EA	110		
47	OTDR Trace	EA	110		
48	Fiber Optic As Built Drawings	EA	7		
49	Labor (technical/Inspector)	Hr	70		
50	Labor Emergency Rate (Technical/Inspector)	Hr	110		
51	Repair Asphalt Concrete Surface	SF	700		
50	Repair Portland Cement Concrete Pavement (PCCP)	SF	700		
53	Repair Sidewalk	SF	700		

Maintenance of ATMS Fiber Optic System
Region 2
Summary of Items

	DESCRIPTION	unit	quantity	unit price	extended price
54	Repair Stamped Decorative Surface	SF	525		
55	Repair Curb and Gutter	SF	525		
56	Repair Landscaping	SF	525		

Maintenance of ATMS Fiber Optic System
Region 3
Summary of Items

	DESCRIPTION	unit	quantity	unit price	extended price
1	Traffic Control	Lump	3		
2	1 inchs Conduit Trenched in Native Earth	LF	30		
3	2 inchs Conduit Trenched in Native Earth	LF	30		
4	3 inchs Conduit Trenched in Native Earth	LF	30		
5	1D Conduit Trenched in Native Earth	LF	30		
6	2D Conduit Trenched in Native Earth	LF	30		
7	4D Conduit Trenched in Native Earth	LF	30		
8	1 inchs Conduit Bored, Jacked, or Drilled	LF	30		
9	2 inchs Conduit Bored, Jacked, or Drilled	LF	30		
10	3 inchs Conduit Bored, Jacked, or Drilled	LF	30		
11	1D Conduit Bored, Jacked, or Drilled	LF	30		
12	2D Conduit Bored, Jacked, or Drilled	LF	30		
13	4D Conduit Bored, Jacked, or Drilled	LF	30		
14	1 inchs Conduit Trenched in Native Earth	LF	30		
15	2 inchs Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
16	3 inchs Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
17	1D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
18	2D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
19	4D Conduit Trenched in Pavement, Concrete, Sidewalk	LF	30		
20	Spot Repair 1 inchs Conduit	EA	2		
21	Spot Repair 2 inchs Conduit	EA	2		
22	Spot Repair 3 inchs Conduit	EA	2		
23	Spot Repair 1D Conduit	EA	1		
24	Spot Repair 2D Conduit	EA	1		
25	Spot Repair 4D Conduit	EA	1		
26	Type I- Polymer Concrete Junction Box	EA	1		
27	Type II-Polymer Concrete Junction Box	EA	1		
28	Type III-Polymer Concrete Junction Box	EA	1		
29	Single Mode Fiber Optic Cable Installation - 6 Strand Count	LF	450		
30	Single Mode Fiber Optic Cable Installation - 12 Strand Count	LF	450		
31	Single Mode Fiber Optic Cable Installation - 18 Strand Count	LF	450		
32	Single Mode Fiber Optic Cable Installation - 24 Strand Count	LF	450		
33	Single Mode Fiber Optic Cable Installation - 36 Strand Count	LF	450		
34	Single Mode Fiber Optic Cable Removal	LF	450		
35	Type A Fiber Optic Splice Enclosures and Termination	EA	3		
36	Type B Fiber Optic Splice Enclosures and Termination	EA	3		
37	Heavy Duty Spider Fanout Kit (6 Strand)	EA	3		
38	Heavy Duty Spider Fanout Kit (12 Strand)	EA	1		
39	Heavy Duty Spider Fanout Kit (18 Strand)	EA	1		
40	Heavy Duty Spider Fanout Kit (24 Strand)	EA	1		
41	1-3 Fusion Splices	EA	2		
42	4-12 Fusion Splices	EA	2		
43	13-48 Fusion Splices	EA	1		
44	49-96 Fusion Splices	EA	1		
45	97+ Fusion Splices	EA	1		
46	Fiber Optic Light Source/Power Meter Test	EA	23		
47	OTDR Trace	EA	23		
48	Fiber Optic As Built Drawings	EA	2		
49	Labor (technical/Inspector)	Hr	15		
50	Labor Emergency Rate (Technical/Inspector)	Hr	23		
51	Repair Asphalt Concrete Surface	SF	150		
50	Repair Portland Cement Concrete Pavement (PCCP)	SF	150		
53	Repair Sidewalk	SF	150		

Maintenance of ATMS Fiber Optic System
Region 3
Summary of Items

	DESCRIPTION	unit	quantity	unit price	extended price
54	Repair Stamped Decorative Surface	SF	112		
55	Repair Curb and Gutter	SF	112		
56	Repair Landscaping	SF	112		

Special Provision

Exhibit 1, 13553

ATMS CONDUIT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish and install conduit for ATMS field elements and communication.

1.2 RELATED SECTIONS

A. Section 02061: Select Aggregate - UDOT Standards Specification, Latest Edition

B. Section 02705: Pavement Sawing - UDOT Standards Specification, Latest Edition

C. Section 02741: HMA (Hot Mix Asphalt) - UDOT Standards Specification, Latest Edition

D. Section 02776: Concrete Sidewalk, Median Filler, and Flatwork - UDOT Standards Specification, Latest Edition

E. Section 02892: Traffic Signal - UDOT Standards Specification, Latest Edition

F. Section 03575: Flowable Fill - UDOT Standards Specification, Latest Edition

G. Section 13554: Polymer Concrete Junction Box - UDOT Standards Specification, see appendix.

H. Section 13555: ATMS Cabinet - UDOT Standards Specification, see appendix

1.3 REFERENCES

A. ASTM D2241: Standard Specification for Poly-Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series).

B. American National Standards Institutes (ANSI).

C. National Electric Code (NEC).

D. NEC Article 346: Rigid Metal Conduit

E. NEC Article 347: Rigid Nonmetallic Conduit

F. National Electrical Manufacturers Association: (NEMA).

G. NEMA Article TC-2: Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.

H. NEMA Article TC-3: PVC Fittings for Use with Rigid PVC Conduit and Tubing.

I. Underwriters Laboratories (UL).

1.4 Standard Drawings

A. See Standard Drawing AT6, Conduit Details.

PART 2 PRODUCTS

2.1 MATERIALS

A. Conduit and Fittings:
   1. Schedule 40 PVC (poly vinyl chloride) rated at 194 degrees F, as specified. NEMA TC-2, NEMA TC-3, UL Listed.
   2. HDPE (high density polyethylene) SDR11 rated, as specified. ASTM D2241.
   3. Rigid steel as specified. UL-6.
   4. Galvanized as specified. ANSI C80.1.

B. Multi-Conduit
   1. New, prefabricated.
   2. Minimum of 4 each 1 1/4 inch conduit.
   3. Label: FIBER OPTIC COMMUNICATIONS, permanent 1/2 inch black letters, every 6 ft, on outside of each conduit.
   4. Color code each conduit or cell.

C. Provide all materials used in the installation of conduits, such as bends, adapters, couplings, glue, plugs and fittings, to meet or exceed all of the recommendations of the conduit manufacturer for suitable installation.

D. Provide special termination kits from the conduit manufacturer for terminating the conduit in vaults and junction boxes. Provide kits that form a watertight seal of conduit to structure wall.

E. Use complete conduit sections in nominal 20 ft sections; couplings and fittings to provide for watertight integrity.

F. Use complete conduit rigid bend sections (11 1/4, 22 1/2, 45, 90 degree angles) complete with bell and spigot. Do not field bend conduit.

G. Provide #14 solid copper conductor pull wire, Type THHN, for each empty conduit or cell.

H. Provide fiber optic and electrical buried cable marker warning tape that meets the following requirements:
1. Material: Composite reinforced thermoplastic.
2. Tape Color: Orange (communication) or Red (electric).
3. Length: 5 ft minimum.
4. Text: “Caution Buried Communication Cable” or “Caution Buried Electric” (front and back).
5. Text Color: Black.
6. Width: 3 inch minimum (face or diameter).

I. Provide jacketed #14 THHN solid green locator wire.

J. Provide locator wire connection device that meets the following requirements:
1. Screw clamp connection type.
2. Suitable for 22 to 8 AWG.
3. Rated 50 amps.
4. Rated 600 V.
5. Provide zinc bichromate plated steel mounting rail for locator wire connection device.

K. Backfill
1. Flowable Fill: Section 03575.
2. Free Draining Granular Backfill Borrow: Section 02061.
3. Native material: 96 percent compaction.

PART 3 EXECUTION

3.1 INSTALLATION

A. Plans depict conduit routing in schematic form only. Base final routing on actual field conditions at the time of construction, including Blue Stake markings, to prevent conflicts with existing utilities.

B. When installing conduit that houses communication cable, do not allow conduit to deflect vertically or horizontally along its length by a ratio greater than 10:1, (e.g. no more than 4 inch deflection per 40 inch in length).

C. When installing conduit, do not allow the sum total of the vertical and horizontal deflection of conduit between any two junction boxes to exceed 360 degrees.

D. Do not place conduit directly above parallel utilities.

E. If the planned location of conduit is parallel to the existing traffic signal or ATMS conduit, locate conduit within 1 ft of existing parallel conduit run.

F. Install all conduit bends to have a radius that is:
   1. Not less than 12 times the inside diameter of the conduit.
   2. Not less than the minimum bend radius of the cable installed within, per cable manufacturer's specifications.

G. Install conduits that cross finished curbs and gutters, sidewalks, concrete flatwork, textured or decorative surfaces by boring, jacking, or drilling. Entirely replace any damaged section at no additional cost to the Department.

H. Obtain appropriate permits before work commences.

3.2 TRENCH FOR CONDUIT

A. Paved Surface (asphalt concrete):
   1. Prior to any backhoe use, sawcut roadway to roadway base on both sides of trench to provide clean, straight wall for T-patch.
   2. Use flowable fill to within 3 1/2 inch-6 inch of the existing roadway surface, depending on the existing pavement thickness.
   3. Minimum soil compaction under pavement: 96 percent.
   4. Evenly apply tack coat before final backfill.
   5. Restoration patch: match the composition, density, and elevation (±1/4 inch), of the existing surface.

B. Sidewalk or Decorative Pavement.
   1. Use flowable fill to within 3 1/2 inch-6 inch of the existing roadway surface, depending on the existing pavement thickness.
   2. Minimum soil compaction under pavement: 96 percent.
   3. Restore sidewalk or decorative pavement to original condition or better after work is completed.

C. Unpaved Surface:
   1. Use backfill that matches the composition, density, and elevation (±0.2 inch), of the existing surface.
   2. Dispose of surplus material daily.

D. Conduit under Railroad Right-of-Way: Refer to Section 00725, Article: Railway Highway Provisions, and appropriate Railroad, such as Union Pacific Railroad, Standard Specifications:
   1. Coordinate all work with appropriate Railroad personnel.
   2. Complete Railroad Safety Training.

E. Minimum cover of conduit:
   1. Minimum cover in sidewalks, paved ditches, unlined ditches, gutters: 2 ft.
   2. Minimum cover in highway right of way under pavement surface: 3 ft.
   3. Minimum cover within 20 ft of edge of pavement where signs or delineators are located: 5 ft.
   4. Where final landscape above conduit is not finished and has elevation greater than adjacent curb, use top back of curb as base elevation for determining minimum cover.

F. Warning Tape:
   1. Install orange warning tape with black legend CAUTION - BURIED COMMUNICATION CABLE in all trenches containing multi-duct conduit or conduit containing communication cables.
   2. Install red warning tape with black legend CAUTION - BURIED ELECTRIC in all other trenches.
   3. Not required when flowable fill is directly overlayed with asphalt pavement or PCCP.
   4. Not required when boring conduit.

G. Locator Wire:
   1. Install #14 THHN solid green locator wire continuously in 1 inch conduit and bond to grounding rods within each junction box.
   2. Mount locator wire connection device to the side wall of each junction box using a mounting rail.

3. Connect the locator wire to the terminal block and connect the terminal block to the ground rod.
4. Weld or clamp locator wire at transition if a sweep is used in place of a junction box at a transition between GRS and PVC. Provide corrosion protection as per NEC Article 346 at location of weld or clamp.

3.3 INSTALL CONDUIT

A. Place all conduits in the same trench before surfacing.

B. Above ground use galvanized rigid steel; underground use PVC or HDPE. Apply corrosion protection per NEC Article 346 to any portion of galvanized rigid steel conduit buried in the ground or encased in concrete.

C. Seal uncapped conduit ends inside junction box with duct seal. Insert seals a minimum of 2 inches inside the conduit.

D. Install #14 stranded THHN pull wire in all empty conduit including all cells of multi-duct conduit.
1. On each end of conduit install plug with 1/4 inch hole for pull wire.
2. Leave 2 ft of pull wire outside of the plug and fasten securely to plug.

E. Place all conduit that passes through a structural member in a metallic sleeve.

F. Secure conduit on structures with standard galvanized iron conduit clamps using at least 5/16 inch diameter concrete expansion anchors at maximum 5 ft spacing.

G. Use conduit expansion fittings at structure expansion joint crossings.

H. Install all conduits so the backfill completely surrounds all exterior surfaces of the conduit. Separate multi-duct conduits using a commercially available conduit spacer or approved equivalent.

I. Install a bushing or adapter at ends of all nonmetallic conduit that contains a conductor per NEC Article 346, to protect the conductor from abrasion. Install rounded bushings on the ends of metal conduits per NEC Article 347.

J. Fill all new and existing conduit to less than 40 percent as per NEC.

K. Install bends in the multi-conduit to be manufactured sweeps (11 1/4, 22 1/2, 45, 90 degree angle) with conduit compatible bell and spigot ends.

L. Prior to pouring flowable fill, anchor the conduit in trench, at 16 ft intervals, to maintain the required conduit depth during pour.

M. Minimum separation between all conduit is 1.5 inch. The separation between individual conduit within a single cluster of multi-duct conduit are permitted to be closer.

N. Minimum separation between all conduit and the wall of the trench is 1.5 inch.

O. Place the locator wire conduit on the plane of the uppermost conduit in the trench. The separation between the locator wire conduit and other conduit may be less than 1.5 inch.

P. In native earth, do not place flowable fill closer than 6 inch to finished grade.

Q. If flowable fill is used, encapsulate conduit a minimum of 3 inch above the top conduit with flowable fill.

3.4 USE OF OCCUPIED CONDUIT

A. Maintain the physical condition and functional integrity of all cabling and wiring in existing occupied conduit.

B. Prior to installing fiber optic cable in an occupied conduit:
1. Remove any existing fiber optic cable/copper wire
2. Re-pull new and existing fiber optic cable/copper wire together
3. Perform all necessary fiber splices, replace any impacted fiber cable spider fan-out kits
4. Perform all additional necessary work needed to restore existing fiber optic system

3.5 REPAIR/RESTORATION

A. Restore all areas, including landscaping, concrete pavement, asphalt, finished curbs and gutters, box culverts, sewers, underground water mains, sprinkler systems, sidewalks, concrete flatwork, textured or decorative surfaces, that were damaged during conduit and junction box installation.

B. Coordinate with local utilities for utility repair. Advise the Engineer of all repairs.

END OF SECTION

SPECIAL PROVISION

EXHIBIT 2, 13554

POLYMER CONCRETE JUNCTION BOX

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish and install polymer concrete junction box, ground rod, and maintenance marker.

1.2 RELATED SECTIONS

A. Section 02061: Select Aggregate - UDOT Standards Specification, Latest Edition

B. Section 02842: Delineators - UDOT Standards Specification, Latest Edition

C. Section 02892: Traffic Signal - UDOT Standards Specification, Latest Edition

D. Section 03055: Portland Cement Concrete - UDOT Standards Specification, Latest Edition

1.3 REFERENCES

A. ASTM C 109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm cubes).

B. ASTM C 496: Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.

C. ASTM C 1028: Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method.

D. ASTM D 543: Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.

E. ASTM D 570: Standard Test Method for Water Absorption of Plastics.

F. ASTM D 635: Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastic in a Horizontal Position.

G. ASTM D 790: Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Insulating Materials.

H. ASTM G 154: Standard Practice for Operating Flourescent Light Apparatus for UV Exposure of Nonmetallic Materials.

I. ANSI/UL 467: Grounding and Bonding Equipment.

1.4 Standard Drawings

a. See Standard Drawing AT7, Polymer-Concrete Junction Box Details.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide special termination kits from the conduit manufacturer for terminating the conduit in junction boxes. Provide kits that form a watertight seal of conduit to structure wall.

B. Use free draining granular backfill borrow as per Section 02061.

C. Provide maintenance markers for junction boxes along freeways and expressways.

D. Provide concrete AA(AE) for concrete collar. Refer to Section 03055.

E. Fabricate junction boxes per the size and type specified in the plans. Boxes are made from polymer concrete.

F. Use body, ring, and lid meeting the physical and chemical requirements listed in Table 1:

Table 1

Property	ASTM Test	Value
Compressive Strength	C 109	11,000 psi
Flexural Strength	D 790	7500 psi
Tensile Strength	C 496	1700 psi
Effects of Acids	D 543	Very Resistant
Effects of Alkalies	D 543	Very Resistant

G. Provide all components with ultraviolet inhibitors per ASTM G 154.

H. Provide all components flame-resistant per ASTM D 635.

2.2 JUNCTION BOXES AND LIDS

A. Provide junction boxes and vaults that resist water absorption in accordance with ASTM D 570.

B. "Load Rating 3" for Non Wheel Loading Accessible, Behind Sidewalk

1. In area behind sidewalk, provide boxes, rings, and lids that sustain a minimum vertical test load of 12,000 pounds over a 10 inch x 10 inch square.

C. "Load Rating 2" for Incidental Vehicular Traffic:

1. In area not in traveled way, provide boxes, rings, and lids that sustain a minimum vertical test load of 22,500 pounds over a 10 inch x 20 inch square.
2. Provide concrete collar per Standard Drawing AT-7 for all boxes that may experience incidental traffic.

D. "Load Rating 1" for Deliberate Vehicular Traffic:

1. In traveled way, or in any paved area immediately adjacent to the mainline, such as shoulders, snow storage areas, or vehicle pullout areas, provide boxes, rings, and lids that sustain a minimum vertical test load of 45,000 pounds over a 10 inch x 20 inch square.
2. Provide steel ring and steel lid.

E. Provide a poured-in-place 1 inch thick grout floor, with a 1 inch diameter drain, for all type I-PC, II-PC, and III-PC boxes.

F. Provide lid for all junction boxes as specified by application.

G. Provide lids with a non-skid surface with minimum coefficient of friction of 0.50, per ASTM C 1028. Coatings will not be approved.

H. Mark the junction box lid in the logo area with 1 inch letters:

1. "Traffic Signal" when the junction box contains cables or wires for traffic signal, CCTV, VMS, RWIS, WIM, ramp meter, traffic monitoring, or any other ATMS element.

2. “Traffic Signal” when the junction box contains power conductors under 480 V used for traffic signal, CCTV, VMS, RWIS, WIM, ramp meter, traffic monitoring, or any other ATMS element.

3. “Electric - 480 V” contains power conductors at 480 V used for traffic signal, CCTV, VMS, RWIS, WIM, ramp meter, traffic monitoring, or any other ATMS element.
4. “Street Lighting” when the junction box contains street lighting conductors only. Inscribe “High Voltage” below the words “Street Lighting” when the junction box contains voltage above 600 V.
5. "Communication” when the junction box contains multi-duct conduit for future use.
6. “Sprinkler Control” when sprinkler control conduit enters the junction box.

I. Provide lids with recessed access point to allow removal of cover with a hook or lever. Damage to the pulling point in the lid must be repaired.

J. Provide lids with vandal-resistant stainless steel recessed bolts.

2.3 MAINTENANCE MARKERS

A. Steel posts: Refer to Section 02842.

2.4 BACKFILL

A. Compact free draining granular backfill borrow under junction boxes. Refer to Section 02061.

2.5 DUCT SEAL

A. Waterproof, rodent proof, non-corrosive, non-oxidizing, and non-hardening when subject to temperatures ranging from -13 degrees F to 150 degrees F. Do not use foam sealant.

2.6 GROUND ROD

A. Copper-coated steel as specified.

B. ANSI/UL 467.

2.7 GROUND WIRE

A. Ground Wire: Refer to Section 02892.

PART 3 EXECUTION

3.1 JUNCTION BOX AND EXTENSION

A. Install per manufacturer's recommendations.

B. Cast conduit holes in junction box at the time of pre-casting or drill at the time of placement with no structural damage to the box.

1. Holes drilled in junction box must not be more than 1/4 inch larger than conduit diameter.
2. Seal conduit ends inside all junction boxes with at least 2 inch thick duct caulking after wires are installed.

C. Place the top of the junction box flush with the surrounding grade or set at the planned finished grade.

D. Hand tamp the backfill material around the junction box. Match the top 4 inches to the composition, density, and elevation of the surrounding surface.

E. Do not install junction boxes inside of railroad right of way.

F. Field locate junction boxes to avoid steep slopes and low lying locations with poor drainage.

G. Do not install junction boxes within the traveled way, shoulders, or on approaches to signal poles.

H. Do not install conduit in corner of junction box, or within 2 inches of corner of junction box. Extend multi-duct conduit 6 inches (nominal) beyond the inside wall of the junction box. Extend all other non-multi-duct conduit 2 inches minimum to 3 inches maximum beyond the inside wall of the junction box. Refer to Standard Drawing AT-7.

I. Extend conduit entering through bottom of junction box 4 inches above the top of floor.

J. Orient the recessed access point in a location which provides both leverage and safety.

K. Saw cut concrete or other improved surfaces that require removal in the sidewalk area. Remove entire section of sidewalk. Replace with in-kind materials to match the existing grade.

L. Provide 12 inches deep free draining granular backfill borrow directly under junction box.

M. Install expansion joint material around entire periphery of ring for junction boxes installed in paved surface.

3.2 CONCRETE COLLAR

A. See Standard Drawing AT-7.

B. Concrete: AA(AE). Refer to Section 03055.

C. Do not install concrete collar for junction boxes in paved surface. Install concrete collars in areas of incidental traffic.

D. Place an expansion joint filler between junction box and concrete collar. Refer to Section 3152.

3.3 GROUND ROD

A. Install ground rod to extend maximum 2 inches above box floor.

B. Attach ground wire or locator wire with clamps.

3.4 RESTORATION

A. Restore all areas damaged during the installation of the junction boxes.

END OF SECTION

SPECIAL PROVISION

EXHIBIT 3 SECTION 13555

ATMS CABINET

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish and install or modify concrete foundations of the size and type as specified in the plans.

B. Install ATMS Equipment Cabinet.

1.2 RELATED SECTIONS

A. Section 02892: Traffic Signal - UDOT Standards Specification, Latest Edition

B. Section 03055 : Portland Cement Concrete - UDOT Standards Specification, Latest Edition

C. Section 03152: Concrete Joint Control - UDOT Standards Specification, Latest Edition

D. Section 03211 : Reinforcing Steel and Welded Wire - UDOT Standards Specification, Latest Edition

E. Section 13553 : ATMS Conduit - UDOT Standards Specification, see appendix

F. Section 13554 : Polymer Concrete Junction Box - UDOT Standards Specification, see appenidx

1.3 REFERENCES

A. ASTM A123/A123M: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

B. ASTM A307: Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

C. ASTM B766: Standard Specification for Electro-deposited Coatings of Cadmium.

1.4 SUBMITTALS

A. Submit samples of materials for approval when requested.

B. Submit two copies of the following within 15 days after receiving Notice to Proceed:

1. List of equipment and materials (name of manufacturer, size, and identification number).
2. Wiring diagrams and certifications.
3. Warranties, guarantees, instruction sheets, parts list.

PART 2 PRODUCTS

2.1 CABINET FOUNDATION

A. Concrete: A(AE) required. Refer to Section 03055.

2.2 BOLTS, NUTS, AND HARDWARE

A. For cabinet mounts, provide wedge expansion type, or poured in place, anchor bolts.

1. 3/4 inch x 8 inch expansion anchor bolts.
2. 9000 lbs pullout strength.

B. Provide commercially available framing strut to attach transformers, breaker enclosures, disconnects, or other electrical equipment to cabinet foundation.

1. 12-gauge, U-shaped stainless steel product with 5/8 inch diameter pre-drilled holes.
2. Cross-section dimensions: 1 5/8 inch x 1 5/8 inch minimum.

C. For framing struts, provide wedge expansion anchor bolts to secure framing strut to foundation.

1. 1/2 inch x 8 inch embedded a minimum of 6 inches in foundation.
2. Shear capacity of 2500 lbs and pullout tension capacity of 2600 lbs.

D. Provide stainless steel, galvanized, or zinc plated bolts, nuts, washers, struts, and hardware, as specified.

1. Steel as specified. ASTM A 307.
2. Galvanized as specified. ASTM A 123.
3. Zinc plated as specified. ASTM B 766.

E. Provide nuts that are free-running, by hand, for total thread length.

F. Provide all bolted connections with lock washers, locking nuts, or other approved means to prevent the connection nuts from backing off.

G. Provide nipples, elbows, and grommets necessary for wiring.

2.3 CONDUIT

A. Refer to Section 13553, ATMS Conduit.

B. Refer to Section 02892, Article, Electrical Conduit.

2.4 JUNCTION BOX AND GROUND ROD

A. Refer to Section 13554, Polymer Junction Box.

2.5 POWER SOURCE

A. Refer to Section 02892, Article, Power Source.

2.6 TRANSFORMER AND DISCONNECT

A. Submit specifications for approval.

2.7 BITUMINOUS JOINT FILLER

A. Preformed material. Refer to Section 03152.

PART 3 EXECUTION

3.1 PREPARATION

A. Use maintenance platforms when surrounding area is not paved. Platforms provide access to the cabinets for maintenance activities. Locate cabinet in an area where full access is allowed.

B. Repair any damage to existing utilities.

C. Restore area to the condition prior to beginning work.

D. Field locate cabinet location with the Engineer. Avoid areas with poor drainage. Satisfy clear zone requirements.

3.2 CONSTRUCT CABINET FOUNDATION

A. Reinforcing Steel and Welded Wire : Refer to Section 03211.

B. Verify bolt pattern, conduit runs, and foundation dimensions prior to foundation construction.

1. Orient anchor bolts to accommodate conduit runs.
2. Embed strut anchor bolts a minimum of 6 inches into foundation
3. Embed cabinet anchor bolts a minimum of 6 inches into foundation.

C. Concrete : A(AE) required. Refer to Section 03055.

D. Do not weld reinforcing steel, conduit, or anchor bolts.

1. Use tie wire to secure conduits.
2. Use template to align and secure anchor bolts.
3. Locate steel, conduit, or anchor bolts a minimum of 3 inches from concrete edge.

E. Place the concrete directly into the excavation. Use minimum forming above ground.

F. Provide 36 inches minimum clearance between foundation and all walls, guardrails, poles, and other above-ground features.

G. Do not extend conduit stubs in cabinet more than 3 inches above floor of foundation.

H. Conduit

1. Install all conduit in base of cabinet in a 12 inch x 18 inch rectangle centered in the cabinet base.
2. Refer to the Project Plans for the number, size, and orientation of all conduits entering the junction boxes.
3. Conduit (typical) for power from cabinet with disconnect to Type I junction box

a. One-1 1/2 inch from cabinet to disconnect.
b. One-1 1/2 inch from disconnect to Type I junction box.

4. Conduit (typical) for power from cabinet with disconnect/stepdown transformer to Type I junction box
   a. One-2 inch from disconnect to Type I junction box
   b. One-1 1/2 inch from disconnect to transformer
   c. One-1 1/2 inch from transformer to cabinet
5. Conduit (typical) for communication from cabinet to Type II junction box
   a. Two-3 inch
   b. Four-2 inch
6. Conduit (typical) for communication stubbed out of Type II junction box
   a. Two-3 inch
   b. Four-2 inch
   c. One-3 inch(used as a spare conduit)
7. Above ground, use galvanized rigid steel; underground, use PVC.
8. Install bushings on the ends of metallic conduit. Install end bells on non-metallic conduit.
9. Provide 1 inch minimum spacing between conduit in cabinet base. Cap conduit at both ends until used. Stub conduit a maximum of 3 inches above the concrete base.

I. Orient the cabinet to allow maintenance personnel facing the front door of the cabinet to also face the device (such as VMS, CCTV, RMS, TMS). Orient the cabinet such that the door that accesses the front face of the control equipment is adjacent to the Type II-PC junction box.

J. Trowel finish the foundation surface and level prior to cabinet installation. After the concrete base has cured, leveling can only be accomplished by grinding the top surface.

K. Bituminous filler at concrete joints. See section 03152.

3.3 INSTALL ATMS CABINET

A. Securely fasten the cabinet on concrete foundation. After the cabinet has been installed on the foundation, the cabinet door must be able to fully open and close.

B. Provide a rain-tight seal that does not degrade the NEMA 3R rating of the enclosure for all conduit fittings and chases to adjoining enclosures.

C. Isolate dissimilar materials from one another by stainless steel fittings.

D. Make all power connections as shown in plans.

1. Isolate the neutral bus from the cabinet and equipment ground.
2. Terminate the neutral bus at the neutral lug attached to the meter pedestal.

E. Install caulk between base of cabinet and top of foundation.

3.4 INSTALL DISCONNECT AND/OR TRANSFORMER

A. Install 12 gauge framing strut to the foundation with 3 expansion anchors per superstrut.

B. Install disconnect and transformer on the side of cabinet that faces away from the nearest traffic. If wall blocks access to disconnect, then install the disconnect and transformer on the opposite side of cabinet.

C. Ground disconnect on ground rod located in Type I junction box.

D. Ground the transformer to the control cabinet ground terminal.

E. Install disconnect and/or transformer per manufacturer's instructions.

F. Install 5/8 inch spacers on each expansion anchor between foundation and disconnect.

3.5 INSTALL WIRING

A. Conductors:

1. Clean and dry the inside of the conduit before installing conductors.
2. Install grounding conductor in all power circuit conduits.
3. Use powdered soapstone, talc, or other approved lubricants when pulling conductors in conduit.
4. Tape the ends of unused conductors and label them as spares.

B. Ground Wire:

1. Clamp the ground wire from the cabinet ground to the ground rod in the Type II junction box.

C. Neatly arrange wiring within cabinets and junction boxes.

D. Terminate all terminal connections by a mechanical (spade) connector.

E. Identify and label all field terminals and cables.

3.6 INSTALL POWER SOURCE

A. Verify the exact location, voltage, procedure, and materials required by the power company.

B. Follow Standard Drawing SL 6.

END OF SECTION

Special Provision

Exhibit 4, Section 13594

FIBER OPTIC COMMUNICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish, install, and test communication system.

1.2 REFERENCES

A. ASTM A615, Grade 60.

B. Bellcore Testing Requirements GR-771-CORE.

C. EIA/TIA-455-82B: Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable (ANSI/EIA/TIA-455-82B-92).

D. NEC 250-1: National Electric Code Grounding.

E. Telcordia GR20-CORE: Optical Fiber and Optical Fiber Cable.

F. Telcordia GR-771: Fiber Optic Splice Enclosure.

G. TIA/EIA-4720000-A: General Specification for Fiber Optic Cable (ANSI/TIA/EIA-4720000-A-93).

H. TIA/EIA-598-A: Optical Fiber Cable Color Coding (ANSI/TIA/EIA-598-A-95).

I. USDA Rural Electrification Administration (REA) specification for filled fiber optic cables (PE-90).

1.3 RELATED SECTIONS

A. Section 13553: ATMS Conduit.

B. Section 13554: Polymer Concrete Junction Box.

C. Section 13555: ATMS Cabinet.

1.4 DEFINITIONS

A. OTDR: Optical Time Domain Reflectometer

B. OSP: Outside Plant

1.5 SUBMITTALS

A. Evidence of training and experience for fiber optic staff. Include in the file for each technician a resume listing relevant education and experience, and a certificate of completion for the fiber optic training course.

B. For approval:

1. A detailed construction and installation procedure covering all aspects for the fiber optic cable installation on this project.

2. All materials for the fiber optic cable installation on this project.

3. Fiber labeling setup.

C. Prior to the splicing of any fiber cable, submit to the Engineer the part number and manufacturer of the cleave tool along with an "end angle" distribution chart which demonstrates the actual 150 cut end angles.

D. Submit to the Department and maintain on file a current calibration certificate for the OTDR being used.

E. Submit OTDR test results to the Department in a neatly bound and printed format for acceptance. Electronic submittal to Engineer on floppy disk or CD is also required.

F. Submit Power Meter/Light Source Test results to the Department for acceptance (Fiber Optic Continuity Test Form).

1.6 ACCEPTANCE TESTING

A. Contact the Engineer 48 hours prior to performing all acceptance testing (Post Termination and Splicing OTDR and Power Meter).

B. Perform all fiber optic testing with an OTDR capable of producing output files

compatible with the Siecor OTDR 383PCW Version 1.21 or higher.

C. After completing the required work, use an OTDR to test one strand per buffer tube randomly selected by the Inspector. Conduct the test for each and every buffer tube running through the splice closure.

D. If the OTDR trace for any randomly selected strand shows evidence of damage, OTDR test each and every strand passing through the splice enclosure.

E. Repair any damaged fiber strands using fusion splicing methods and repeat all tests described below.

F. OTDR Testing Requirements

1. After completing the required work, test every fiber strand passing through any splice tray that was opened by the Contractor.
2. Conduct all traces with a pigtail or fiber box between the OTDR and the fiber under test.
3. Maintain minimum length of the fiber in the fiber box greater than the dead zone specified by the manufacturer.
4. Do not exceed launch transition of 6 dB.
5. Conduct all traces at both 1310 nm and 1550 nm.
6. Unless otherwise noted, unidirectional traces are acceptable.
7. Provide traces with the following information:
   a. Horizontal Axis: Distance in Feet and Kilometers..
   b. Vertical Axis: attenuation scale in dB.
   c. Traces showing attenuation versus distance.
   d. Cursors positioned at cable ends.
8. Tabulate for each trace: method, fiber type, wavelength, pulse width, refraction index, range, search threshold, reflection threshold, end threshold, warning threshold, backscatter, jumper length, file date, file time, fiber ID, cable ID, OTDR location, far end location, operator initials.
9. Provide an event table showing all events having more than 0.05 dB loss, containing event type, position from OTDR end, loss and reflectance.
10. For cables less than 3300 ft (1 km) in length, the maximum total allowable attenuation is 1.0 dB.
11. Identify fibers by strand number.

13 Submit results in printed form on 8 ½ x 11 paper in a suitable binder organized by cable and strand number.

12. A cover sheet is required for each binder indicating which cable(s) were tested, the OTDR users name, the reviewers name, the type of test performed and the date(s) of the test.

14. Cover sheets for final test results bearing the reviewers signature, the date, and a statement indicating that the installation complies with the requirements of this section is required.
17. The Contractor's employee who has reviewed the traces is required to sign or initial them. A check mark is required on all traces that satisfy the requirements identified herein. For intermediate test results, flag any discrepancies which may exist with a short description of the proposed corrective action. (e.g. resplice).
18. Submit to the Engineer on 3 ½ inch floppy disk or CD electronic media with a printed index.

G. Post Termination and Splicing Test

1. Test every strand in all cable segments including connectorized strands of drop cables.
2. Light Frequency: 1310 nm and 1550 nm.
3. Direction: Bidirectional.
4. Location of test: Every field location required to obtain access to each cable segment.
5. Test after terminating and splicing at all points shown on the plans.
6. Cable Tested by: Certified Contractor Staff.
7. Department inspector witnesses and approves before final approval by the Engineer.
8. Acceptance Criteria:
   a. Cable attenuation # 0.4 dB/km at 1310 nm excluding splices shown on the plans or authorized by the Engineer.
   b. Cable attenuation # 0.25 dB/km at 1550 nm excluding splices shown on the plans or authorized by the Engineer.
   c. Strand lengths are consistent.
   d. Launch Transition < 6 dB.
   e. No event > 0.30 dB**.**
   f. Maximum splice attenuation 0.20 dB per splice unless otherwise shown on the plans.
9. Trace available for each strand in all cable segments.

H. Power Meter Test

1. Connect the light source to the connectorized fiber at the location identified on the Fiber Optic Test form. Connect a power meter to the other end of the fiber at the location identified on the Fiber Optic Test form.

2. Turn on the light meter and record the power received at the power meter in the appropriate location on the Fiber Optic Test form.
3. Specifically indicate the fibers tested on Fiber Optic Test form. Otherwise, test each strand in every cable segment including connectorized strands of drop cables.
4. Use the light frequencies of 1310 nm and 1550 nm, or as indicated in test plans.
5. Perform the test uni-directional.
6. Test every field location required to obtain access to each cable segment.
7. A qualified member of the Contractor staff will perform all testing.
8. A Department inspector witnesses and approves the results before final approval by the Engineer.
9. Acceptance Criteria:
    a. Cable attenuation as called for in test plans.
    b. Strand lengths are consistent.
    c. Launch Transition less than 6 dB.
    d. No event less than 0.30 dB.
    e. Maximum splice attenuation 0.20 dB per splice unless otherwise shown on the plans.
    f. Trace is available for each strand indicated in test plans. Otherwise, trace will be available for each strand in each cable segment.

I. Light Source Test

1. Connect the light source to the connectorized fiber number at the location identified in the Fiber Optic Test Forms. Connect a power meter to the other end of the fiber at the location identified in the Fiber Optic Test Forms.
2. Testing:
    a. Turn the light source off and on at a rate of approximately once per second for three cycles. Observe the power meter and record the response of the meter in the appropriate location on the Fiber Optic Continuity Test form.
    b. Indicate OK if the Contractor notes the meter responding to each of the three cycles. Indicate BAD for any other responses, such as no cycles, less than three cycles, or more than three cycles.
    c. For each bad response, submit to the Engineer a statement summarizing the response.
    d. A tone modulated light source may be used, in place of the three cycle method, to conduct this test.

J. Fiber Optic Continuity Test Form

1. Complete the ATMS Fiber Optic Continuity Test Form included at the end of this Section and submit the completed form to the Engineer. This form identifies the specific set up location for the power meter and light source.
2. Connect the light source to the connectorized fiber number at the location identified in the ATMS Fiber Optic Continuity Test Form. Connect a power meter to the other end of the fiber at the location identified in the ATMS Fiber Optic Continuity Test Form.
3. Turn on the light meter and record the power received at the power meter in the appropriate location on the ATMS Fiber Optic Continuity Test Form.
4. The Fiber Optic Continuity Test Form identifies the specific set up location for the power meter and light source.

K. Perform all work to conform to the National Electric Code.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials are UL listed.

B. Provide all incidental materials including but not limited to fiber optic jumpers, cable ties, labels, data cables, and connectors.

2.2 FIBER OPTIC CABLE

A. Contact the Engineer for approval of fiber that is to be used.

B. The fiber optic cable is an Outside Plant (OSP) type, nonarmored dielectric loose tube, single mode cable.

C. Packing and Shipping (OSP Cable):

1. Ship the cable wound on spools or reels.
   a. Pack only one continuous length of cable per spool.
   b. Package the cable to prevent damage during shipping and handling.
2. When a length of cable's weight exceeds 800 lbs, a large wooden reel with wooden staves is required.
   a. Cover the cable with a thermal wrap.

b. Secure the outer end of the cable to the reel head to prevent the cable from becoming loose in transit.
c. Project the inner end of the cable a minimum of 6 ft into a slot in the side of the reel or into a housing on the inner slot of the drum, in such a manner to make it available for testing.
d. Arbor hole: 1 ½ inches minimum.

3. Test tails: at least 6 ft. long.
   a. Fasten the inner end to prevent the cable from becoming loose during shipping and installation.
   b. Apply end seals to each end of the cable to prevent moisture from entering the cable.
4. Mark each reel with an identification number that can be used by the manufacturer to trace the manufacturing history of the cable and the fiber.
5. Mark each reel to indicate the direction in which it should be rolled to prevent loosening of the cable on the reel.
6. Include the manufacturer's test documentation with each reel. This documentation indicates the attenuation of each cable fiber in dB/km (dB/ft), measured at 1310 nm and 1550 nm for single mode.

D. Outside Plant (OSP) Single Mode
General Characteristics:

1. Each OSP cable is of one type with the following features: all dielectric, loose tube, conforming to PE90 outside plant cable.
2. Provide all fiber optic cable on this project from only one manufacturer who is regularly engaged in the production of this material.
3. Fiber cables:
   a. all one mode (single or multimode),
   b. single mode and multimode under one sheath construction (HYBRID CABLE), or
   c. optical fiber/copper combination (COMPOSITE).
4. Install single mode fiber optic cable for the fiber optic communication system. The fiber cable conforms to the following:
   a. Latest version of Telcordia Technologies GR20-CORE: Generic Requirement for Optical Fiber and Optical Fiber Cables;
   b. TIA/EIA-4720000-A: Generic Specification for Fiber Optic Cable;
   c. United States Department of Agriculture (USDA) Rural Electrification Administration (REA) PE-90: REA Specification for Filled Fiber Optic Cables (updated per Bulletin 1753F-601 on August 4, 1994); and appropriate sectional specifications.
5. Fiber optic cable: free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of this specification.

6. The fiber cable contains a water-blocking material in a loose tube construction with up to 12 buffer tubes wrapped around a dielectric central strength member. All fiber(s) are contained within buffer tubes, and each buffer tube has an inside diameter much greater than the total diameter of the fiber(s) it supports.
7. Each fiber or group of fibers free floats within the tubes such that all mechanically or environmentally induced stress placed upon the cable is decoupled from the fibers. Air within the buffer tubes is displaced by the water-blocking material to prevent entry by water and to facilitate free movement of the fiber(s) within.
8. Buffer tubes: color coded in compliance with TIA/EIA598, Color Coding of Fiber Optic Cables. Cables constructed with equal distribution of fibers as far as feasible. Color code all fiber to comply with TIA/EIA598.
9. Each buffer tube of the cable contains water-blocking material to prevent entry of water.
    a. Water blocker: provided between the cable jacket and the outside of the buffer tubes.
    b. Binder wrapping strength member of aramid fibers: provided as a final layer prior to application of the outer jacket.
10. Outer jacket:
    a. Constructed of medium density polyethylene.
    b. Minimum thickness: 0.055 inches.
    c. Applied directly over the tensile strength members and water blocking means.
    d. Outer jacket is UV and fungus resistant.
11. Outer jacket labeling:
    a. The date of manufacture and the manufacturer's name.
    b. A numerical sequence, at intervals no greater than 9.843 ft (3 Meters), to determine the length of cable and amount of cable remaining on the reel.
    c. "Utah Department of Transportation Fiber Optic Cable" at an interval of no greater than 9.843 ft (3 Meters).
    d. Height of the markings is 1/8 inch nominal.
12. All optical fibers are 100 percent attenuation tested at the factory for compliance with performance specifications described in this section. The attenuation results of each fiber are provided with each cable reel.
13. All fiber cable is suitable for installation in underground conduit or lashed to messenger cable, and meets or exceeds the following specifications:
    a. Operational Wavelength: 1310 nm and 1550 nm.
    b. Optical Attenuation: at 1310 nm: 0.4 dB/km at 68 degrees F. at 1550 nm: 0.25 dB/km at 68 degrees F.
    c. Optical Dispersion: at 1310 nm: # 4.5 psec/nm-km at

1550 nm: # 20 psec/nm-kmZero.

d. Dispersion Wavelength:1300 to 1320 nm, nominal.
e. Zero Dispersion Slope: # 0.092 ps/nm^2-km.
f. Fiber Core Diameter: 8.3 Fm, typical.
g. Fiber Coating Diameter: 250 +/- 10 mm.
h. Fiber Cladding Diameter: 125 +/- 1 mm.
i. Core to Cladding Offset: # 0.8 mm.
j. Cladding Non-Circularity: # 1.0 percent.
k. Spot Size: 9.3 +/- 0.5 Fm at 1310 nm.
10.5 +/-1 mm at 1550 nm.
l. Cutoff Wavelength: # 1250 nm.
m. Crush Resistance: 300 lb/ft, length of cable.
n. Cable Outside Diameter: ½ inch, maximum.
o. Minimum Bending Radius:
Installation: 20 times cable outside diameter.
Static: 10 times cable outside diameter.
p. Operating Temperature:
Installation: -22 F to 158 F.
Storage/Operation: -40 F to 158 F
q. Humidity: 0 to 100 percent.
r. Tensile Strength:
Installation: 600 pounds
Static: 135 pounds

14. The cable is waterproof, complying with water penetration test conducted in accordance with EIA/TIA-455-82-B for fluid blocking fiber optic cable.

15. Fiber optic drop cables
a. With the number of fiber strands and connectors as shown on the plans.
b. Terminated with ST or ST compatible connectors, installed using factory approved procedures.
c. With connectors for all fiber strands that have present usage.
d. Drop cable fan out kits: heavy duty Spider design.
e. Buffer tubes: protected by the cable sheath or fan out kit. Exposed buffer tubes are not acceptable.
f. Individual fiber strands: protected by 0.11 inch kevlar tubes.
g. Minimum tubing length is 24 inches.

E. Factory Test
1. Fibers Tested: Each strand.
2. Light Frequency: 1310 nm and 1550 nm.

3. Direction: unidirectional.
4. Location: Cable Factory.
5. When Performed: Tested prior to shipment.
6. Tested by: Factory Staff.
7. Cable meets factory attenuation specifications.
    a. Cable attenuation # 0.4 dB/km at 1310 nm.
    b. Cable attenuation # 0.25 dB/km at 1550 nm.
    c. Strand lengths are consistent.
    d. Launch Transition < 6 dB.
    e. No event > 0.30 dB.
8. Traces will be available for each strand in cable.

2.3 FIELD FIBER OPTIC DATA MODEM (STATE FURNISHED ITEM)

A. Designed to support full duplex asynchronous RS232 communications in a multidrop counter rotating ring, daisy chain, and two-headed daisy chain topology.

B. Configurable as master submaster or local units and meeting the following specifications:
1. Optical Loss Range: 0 - 17 dB.
2. RS-232 Data Rate: DC to 100 kbaud.
3. Operating Wavelength: 1310 nm.
4. Fiber Type: Single Mode.
5. Pilot Tone Frequency: 430 to 450 khz.
6. Power Supply: External Transformer 120 VAC Primary, 8 to 18 VDC secondary.
7. Operating Temperature: -35 F to + 167 F.
8. Humidity: 0 to 98%.
9. Optical Connector: ST.
10 Data Connector: DB25 F.
11. LED Indicators: TD1, RD1, TD2, RD2, Power, Fault.
12. AntiStreaming Timeout: User Selectable 4, 8, 16, 32, or 64 seconds or disabled.
13. Fault Output: Dry contact closure.
14. Compatibility: optically and electrically operate with Force Model 2869 in the same circuit.
15. Package: Shelf Mount 6 inch x 6 inch x 1 1/4 inch maximum.

2.4 FIBER OPTIC CONNECTORS

A. With the following characteristics:
   1. Factory installed or field installed ST or ST compatible connectors.
   2. Ceramic ferrules and metallic connector bodies.
   3. Maximum insertion loss: 0.50 dB. Maximum insertion loss of 1.0 dB is acceptable with approval of the Engineer.
   4. Connector back reflection: greater than 35 dB.

B. Clean all connectors with alcohol wipes and a compressed cleaning gas.

C. Furnish and install new spider fan-out kits, to replace any existing fan-out kits that must be severed in order to make ST connections.

2.5 CLOSET CONNECTOR MODULE

A. Required in existing closet connection housings and hub shelters entered by fiber optic cables.

B. Characteristics:
   1. Six fibers per module.
   2. Six ST connectors.
   3. Six strand factory made single mode pigtail.
   4. Height equivalent to four rack units high.
   5. Mate with Siecor existing CCH-04U closet connector housing.
   6. Siecor CCH-CM06-61 or equivalent.

2.6 STAND ALONE VIDEO OPTICAL TRANSMITTER

A. Physical Characteristics
   1. Maximum Size: 8 inch x 4 ¾ inch x 1 ½ inch.
   2. Maximum Weight: 2.2 lbs.
   3. Mounting Holes: 4 minimum.
   4. Package: High quality aluminum, complete enclosure.
   5. Indicators: LED type, neatly labeled and visible from mounted position.
   6. User Settings: No user adjustments or settings.

B. Electrical Characteristics
   1. Application: Single Fiber Uni-Directional RS-250C Medium Haul Video Transmitter with bi-directional RS-232 data.
   2. Modulation: Frequency Modulation or digital encoding.
   3. Data Connector: DB 9 F.

4. Data Rate: up to 19.2 kbps, suitable for bursty data.
5. Bit Error Rate: 10-9 minimum over full optical range.
6. Video Connector BNC.
7. Power Consumption: 1-Watt maximum.
8. Video Signal to Noise: 50-dB minimum unweighted over full optical range.

C. Optical Characteristics
1. Physical: ST Type Connector.
2. Optical Range: 18 dB for Single Mode Fiber, 13 dB for multi-mode fiber.
3. Operating Wavelength: 1310 nm.
4. Backreflection: Tolerance of -35 dB.
5. Reliability: Laser Mean Time Between Failure 500,000 hours.

D. Compatibility: directly interchangeable.

2.7 RACK MOUNT VIDEO OPTICAL RECEIVER

A. Physical Characteristics
1. Maximum Size: 8 inch x 4 ¾ inch x 1 ½ inch.
2. Maximum Weight: 2.2 lbs.
3. Mounting: Sliding Rack Mount Card with retainers.
4. Package: High quality aluminum, complete enclosure, compatible with rack mounting chassis.
5. Indicators: LED type, neatly labeled and visible from mounted position.
6. User Settings: No user adjustments or settings.

B. Electrical Characteristics
1. Application: Single Fiber Uni-Directional RS-250C Medium Haul Video Receiver with bi-directional RS-232 data.
2. Modulation: Frequency Modulation or digital encoding.
3. Data Connector: DB 9 F.
4. Data Rate: up to 19.2 kbps, suitable for bursty data.
5. Bit Error Rate: 10-9 minimum over full optical range.
6. Video Connector BNC.
7. Power Consumption: 1-Watt maximum.
8. Video Signal to Noise: 50-dB minimum unweighted over full optical range.

C. Optical Characteristics
1. Physical: ST Type Connector.
2. Optical Range:18 dB for Single mode fiber, 13 dB for multi-mode fiber.

3. Operating Wavelength:1310 nm.
4. Backreflection:Tolerance of –35 dB.
5. Reliability: Laser Mean Time Between Failure 500,000 hours.

D. Compatibility: directly interchangeable.

2.8 RACK MOUNT CHASSIS

A. Width: Suitable for mounting in EIA Standard 19 inch rack.

B. Height: Not to Exceed 4 Rack Units.

C. Depth: Not to Exceed 12 inches.

D. Capacity: Ten Rack Mount Video Optical Receivers.

E. Engineering:
1. Designed to retain ten rack mount cards and provide clear view of indicators and labels on cards.
2. Designed to provide easy access to all optical and electrical connectors.

F. Power Supply:
1. Suitable for powering ten rack mount video optical receivers.
2. UL listed.
3. Equipped with overcurrent protection, power on indicator lamp, and power on/off switch.

G. Line Cord: 6 ft IEC Standard.

H. Input Voltage: 90 to 135 VAC.

I. Input Frequency: 47 to 63 Hz.

J. Output Ripple: 120-mV peak to peak maximum.

K. Output Voltage: Compatible with rack mount video optical receivers over full input voltage range.

2.9 RS-232 SIGNAL DISTRIBUTION UNIT

A. General
   1. Unit feeds data from one RS-232 input communication port to ten RS-232 serial output data communication ports.
   2. Provide looping input for additional signal distribution units.
   3. Compatible with all system components.
   4. One LED indicator per channel.
   5. Maximum Size: 8 inch x 2 ½ inch x 5 ½ inch.

B. Environmental
   1. Temperature Range: 50 degrees F to 105 degrees F.
   2. Humidity: 0-90 percent non condensing.
   3. Weight: Less than 6.6 lb.

C. Power
   1. Input Voltage: Unregulated 15V dc, 800mA.
   2. Transformer: 110V ac, 25 watts.

D. Data Communications
   1. Data Signal Connectors: DB-9 mating, provided.
   2. Data Signal Cable: Belden 8102 or equivalent.
   3. Transmission Distance: Up to 1000 ft at 9600 Baud.
   4. Characteristics: 1 RS-232 input with pass through.
   5. RS-232 Outputs: 10.

E. Provide standard metal rack mount shelf with unit for installation in existing EIA Standard 19 inch rack.

2.10 TYPE A AND B FIBER OPTIC CABLE SPLICE ENCLOSURE

A. Type A: For locations with more than 48 splices.
   1. 6 inch diameter by 22 inch long.
   2. One three section (six entry) end plate.
   3. One blank end plate.
   4. Two or more 36 fiber count fusion splice trays.
   5. All required accessories to complete the splice.
   6. End plates are suitable for use with Coyote closures.

B. Type B: For locations with up to 48 splices.
   1. 6 inch diameter by 17 inch long.
   2. One three section (six entry) end plate.

3. One blank end plate.
4. Four 12 fiber count fusion splice trays.
5. All required accessories to complete the splice.
6. End plates are suitable for use with Coyote Pup closures.

C. General Requirements

1. Capable of handling up to six cables in butt configuration without special adapters.
2. Nonfilled (no encapsulate), to prevent water infusion.
3. UL rated.
4. External Shrader valve pressurization port.
5. Able to reenter and reassemble without special tools.
6. Contain mountings for splice organizer assemblies.
7. Contain space for excess or un-spliced cable.
8. Provide one future cable entry kit with each splice closure.
9. Meet Telcordia Technologies/Bellcore Testing Requirements GR771CORE.
10. Corrosion resistant aluminum and stainless steel hardware.
11. Suitable for straight, butt, or branch splices.
12. Packaged with all hardware necessary for completion of splice.
13. Provisions for strain relief around the cable jacket and internal cable strength members.
14. Enclosure accepts loose tube fiber optic cables.
15. Enclosure accepts up to six cable entries in a butt splice configuration and twelve cables for an inline configuration.
16. Enclosure has a permanent neoprene gasket seal.
17. Enclosure is re-enterable without special reentry kits.
18. Enclosure has premolded three section end plates with six cable entries.
19. End plates are interchangeable with each size of closure available from the closure supplier.
20. All closures, with captive closing hardware, are from the same supplier.
21. Provide glass-filled high-density thermoplastic enclosure shells that effectively withstand corrosion, high impact and freeze thaw stresses.
22. Use torque bars to secure, support and align end plates.
23. Provide enclosure with rubber tape for sealing around cables to provide a seal that compensates for expansion and contraction associated with temperature cycling.
24. Follow manufacturers guidelines for closing enclosure (no power tools shall be used).

2.11 SPLICE ENCLOSURE END PLATE

A. Replace existing plates at splice enclosures that are modified.

B. Suitable for use with Coyote Pup closures.

C. Three section (six entry) end plate.

2.12 SPLICE ENCLOSURES FIBER DETAILS

A. Provide 2 to 3 feet of buffer tube slack from three sections end plate.

B. Provide label for each buffer tube, which shall be located 1 inch from the splice tray. Description on label shall identify as to where fiber cable and direction cable is coming from.

C. Provide 3 to 4 feet of fiber optic strands, outside of buffer tube, from each cable before splicing.

2.13 FIBER OPTIC JUMPER

A. Single mode fiber.

B. 0.12 inch Kevlar outer jacket.

C. ST connector required on each end.

D. Determine length based on physical distance of run. Minimum length: 6 ft.

2.14 JUMPER STORAGE PANEL

A. 2 rack units high.

B. 19 inches wide.

C. Designed for routing of fiber optic jumpers.

D. Matte black finish.

E. Siecor CSP-02U or equivalent.

F. Furnished with cover, mounting hardware, grommets and installation manual.

2.15 RS-422/RS-232 CONVERTER

A. Converts RS-422 data between the CCTV assembly and the video optical transceiver.

B. General
1. Transmits data at distances up to 3300 ft.
2. Operate in multipoint applications.
3. 2 or 4-wire operation.
4. Speeds up to 115.2 kbps.
5. Auto-transmitter enable: baud rates up to 64 kbps.
6. Selectable half-duplex turnaround delay.
7. Selectable RTS-CTS turnaround delay.
8. Echo suppression.
9. Bias enable.
10. Terminate/Reconnect option.
11. Externally selectable loop-back test feature.
12. Operation: 4 wire, half or full-duplex, 2-wire, half-duplex.
13. CE Approval: Yes.
14. Connectors: (1) DB25 F; (1) 4-screw terminal.
15. Power: 115 VAC, 60 Hz.
16. Max Size: 9 inch x 6 inch x 2 inch.
17. Max Weight: 1.1 lb.
18. Mean time before failure: 200,000 hours.

C. Environmental
1. Operating Humidity: 0 to 95 percent non-condensing.
2. Operating Temperature: -32 to 120 degrees F.
3. Storage Temperature: -40 to 160 degrees F.

D. Interface A:
1. RS-232 DTE/DCE selectable.
2. Connectors: DB25 Female.
3. Data Rate: Data rate is transparent up to 115 kbps.
4. Distance: Standard EIA specifications apply.
5. Leads: 2 thru 8 and 20.

E. Interface B:
1. RS-232 or RS-485.
2. Connectors: 4 position screw down terminal strip.
3. Data Rate: Transparent.
4. Distance: 4,000 ft. based on 24 AWG UTP low capacitance cable.

5. Leads: TX+, TX-, RX+, RX-.

2.16 FIBER OPTIC SPLITTER

A. Splits the signal from a fiber optic video transmitter to two different destinations, with the following characteristics:
   1. Compatible with single mode fiber.
   2. 50:50 split of video signal, or weighted ratio as specified.
   3. Maximum dB loss of 3.6 dB.
   4. ST connectors.

2.17 COMMUNICATION SHELTERS

A. Provide prefabricated controlled environmental shelters with an alarm system for remote monitoring.

B. Construction:
   1. Materials: Solid concrete with steel rebar reinforcement. Solid heavy duty steel doors and locks. Reinforcing Steel ASTM A615-85, Grade 60.
   2. Structure: No seams below ground level. Minimum concrete compressive strength: 5000 psi at 28 days.
   3. Design Load: meet or exceed State of Utah Building Codes.
   4. Interior Dimensions: 11 ½ ft wide by 16 ½ ft long by 10 ft high.
   5. Interior Area, Volume: 190 ft^2, 1900 ft^3.
   6. Door Opening: 5 ft wide x 6 ½ ft high.

C. Environmental
   1. Air Conditioning: 30,000 BTU HVAC system.
   2. Heater: 10 kW.
   3. Lighting: Interior 4 dual tube fluorescent fixtures, 40W lamps. Exterior 100W incandescent lamp.

D. Electrical
   1. 120/240 volts, single phase, 100 amps with 10 branch circuits.
   2. 100 amp generator input connector.
   3. Auto alarm system for high temp, smoke, power loss, and intrusion.
   4. Alarm terminal block.
   5. Interior copper ground bar assembly with two through wall ground sleeves.
   6. 4 hour timer switch for lighting.

E. Mechanical
   1. In floor cable entry opening.
   2. Magnetic door switch with alarm.
   3. Electro-mechanical environmental control panel with manual override.
   4. Automatic high limit override.
   5. Wall mounted CO2 fire extinguisher.

PART 3 EXECUTION

3.1 INSTALLERS

A. Complete a three-day course on the installation, splicing and testing of fiber optic cable.
   1. Course: conducted by the supplier of the fiber optic product or established education provider.
   2. In house and on the job training is not acceptable.

B. Demonstrate two years total and one year continuous work experience with the splicing, termination, and testing of fiber optic cable.

C. Perform all work with qualified staff.

3.2 FIBER OPTIC CABLE INSTALLATION REQUIREMENTS

A. Notify the Engineer 48 hours in advance of fiber optic cable installation into any existing conduit or building facility.

B. The Engineer will initiate special inspection procedures to verify the condition of existing communications facilities. Such inspection may be observed by the Contractor.

C. Perform all work in facilities (e.g. conduits, junction boxes, cabinets and buildings) containing Department's existing communications equipment only in the presence of Department’s representative.

D. Restore Contractor damaged facilities within 48 hours.

E. Lubricate cable with a lubricant designed for fiber optic cable installation.

F. Use shear pins or other failsafe means to prevent exceeding the maximum cable pulling tension specified by the cable manufacturer.

G. Maintain the following minimum bend radiuses:
   1. 20 times Cable Diameter Short Term During Installation.
   2. 10 times Cable Diameter Long Term Installed.

H. Maintain the following slack requirements:
   1. Vaults: 70 ft.
   2. All Junction Boxes: 35 ft.

3. Cabinets: 15 ft.

I. Replace any fiber optic cable segment not meeting the requirements of the specifications in its entirety between splice points shown on the plans.

J. Place the locator wire in the dedicated 1 inch conduit as shown in the plan details.

3.3 FIBER OPTIC CABLE PREPARATION

A. Remove the jacket without damaging buffer tubes.

B. Carefully expose the fibers by removing the buffer tube with a special tool.

C. Clean the fibers and buffer tubes using a solvent designed to remove all water blocking gel from each exposed fiber.

D. Solvent requirements:
1. Must not remove any color from individual fibers or buffer tubes.
2. Not harmful to the polyethylene cable jacket.

E. Cleave fiber strands using a cleave tool meeting the following requirements:

1. Ability to cut the individual fibers as close to a perfect 90 degree angle as possible.
2. With minimum end angle averages that are less than 0.70 degree with no cuts exceeding 1.5 degrees.

3.4 ENTRY AND REENTRY OF FIBER OPTIC SPLICE CLOSURES

A. Perform all work in a suitable environment free from excess dust and moisture. Acceptable environments to work on splice closures include office type environments in buildings, splice trailers, and splicing tents with floors.

B. Do not perform fiber splicing, testing, or connecting in freezing temperatures.

C. Do not expose open splice closures and fiber ends to rain, snow, or wind-blown dust.

3.5 FUSION SPLICING

A. All fiber splicing: fusion splice method.

B. Connectors: factory made connector and pigtail or drop cable assemblies.

C. Field polishing of connectors: Not acceptable.

D. Perform fusion splices with the following:
   1. Equipment with automatic fiber alignment and automatic light injection with detection devices or profile alignment algorithms to estimate splice losses.
   2. Provide splice closure as a protection for all splices and stripped cable.
   3. House all splices in splice trays or organizers.
   4. Use glass capillaries, heat shrink tubing, or silicone sealant to provide additional protection and strain relief.
   5. Maximum splice loss allowance is 0.20 dB.

E. Install new splice enclosure end plates at each location where there is a new fusion splice in an existing splice enclosure per manufacturer's recommendations.

3.6 FIELD QUALITY CONTROL TESTING

A. Receiving Test
   1. Fibers Tested: Normally, one strand per buffer tube. Test every strand when evidence of physical damage exists or when any damaged strand is found.
   2. Light Frequency: 1310 nm and 1550 nm.
   3. Direction: Unidirectional.
   4. Location of test: Contractor's yard.
   5. Test after receiving material, before releasing to installation crew.
   6. Tested by: Qualified Contractor Staff.
   7. Cable meets factory attenuation specifications.
      a. Cable attenuation # 0.4 dB/km at 1310 nm.
      b. Cable attenuation # 0.25 dB/km at 1550 nm.
      c. Strand lengths are consistent.
      d. Launch Transition < 6 dB.
      e. No event > 0.30 dB.
   8. Trace available for one strand in every buffer tube in the cable.

B. Post Blowing/Pulling - Pre Splicing Test
   1. Fibers Tested: Normally, one strand per buffer tube. Test every strand when evidence of physical damage, excessive pulling tension, kinks exists, or when any damaged strand is found.
   2. Light Frequency: 1310 nm and 1550 nm.
   3. Direction: Unidirectional.

4. Location of test: One field location for each cable installed.
5. Test after installing cable in duct but before splicing.
6. Tested by: Qualified Contractor Staff.
7. Witnessed/Approved by: Department inspector may witness and must approve before splicing.
8. Acceptance Criteria:
    a. Cable attenuation # 0.4 dB/km at 1310 nm.
    b. Cable attenuation # 0.25 dB/km at 1550 nm.
    c. Strand lengths are consistent.
    d. Launch Transition < 6 dB.
    e. No event > 0.30 dB.
9. Trace available for one strand in every buffer tube in the cable.

3.7 CABLE LABELING REQUIREMENTS

A. Label all fiber optic cables with a high quality permanent label, indicating the street name or location and type of circuit (drop cable, distribution, backbone-96 count).

B. Use Panduit MP-150-C or equivalent.

3.8 INSTALLATION OF HUB FIBER EQUIPMENT

A. Install all Hub equipment in accordance with the plans and the equipment manufacturer's recommendations.
    1. Provide all mounting hardware and incidental materials, including fasteners, shelves, and brackets.
    2. Provide surge protected power strips as needed for all equipment installed in buildings.

B. To gain access to the ATMS Hub, contact the Engineer at least ten working days prior to the time access is needed.

C. The Department may elect to have personnel present in Hub during any activity.

D. Install RS-232 Signal Distribution Unit securely on new shelf on existing rack at location indicated in plans.

E. Install Rack Mount Video Optical Transceivers in rack mount chassis on existing rack at location indicated in plans.

3.9 INSTALL FIELD FIBER COMMUNICATION EQUIPMENT

A. Install field communication equipment in existing signal cabinets as shown in the plans.
   1. Equipment includes stand alone video optical transmitters, field fiber optic data modems, and RS-422/RS-232 converters.
   2. Install equipment in accordance with the equipment manufacturer's recommendations, including mounting, interconnection wiring, electrical service, all mounting hardware and incidental materials, including fasteners and brackets.
   3. Provide all surge protected power strips for all equipment installed.
   4. Install equipment on existing shelf space in cabinets.

ATMS Fiber Optic Continuity Test Form						
Light Source Location	**Channel**	**Source to Strand Number**	**Power Meter Location**	**Meter to Strand Number**	**Power Meter Reading (dBm)**	**On/Off (yes or no)**

END OF SECTION